

Chemical Week

June 23, 1956

Price 35 cents



Supreme Court cellophane decision: trustbusters will find it harder than ever to prove monopoly . p. 21

Harmony holds sway on the labor scene as unions pause to retrench for future moves p. 30

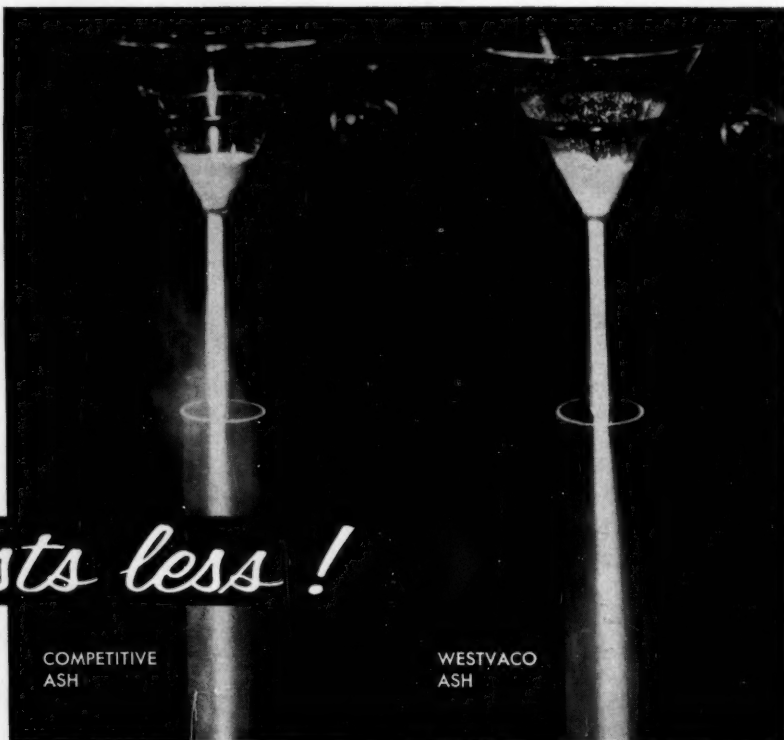
Polish makers are taking a shine to polyethylene for high-quality, low-cost formulations p. 49

Aniline's future will be steadier than its past; output is headed for a consistent climb p. 68

► **Thirty-five thousand throng Plastics Exposition as industry gears for new growth p. 80**



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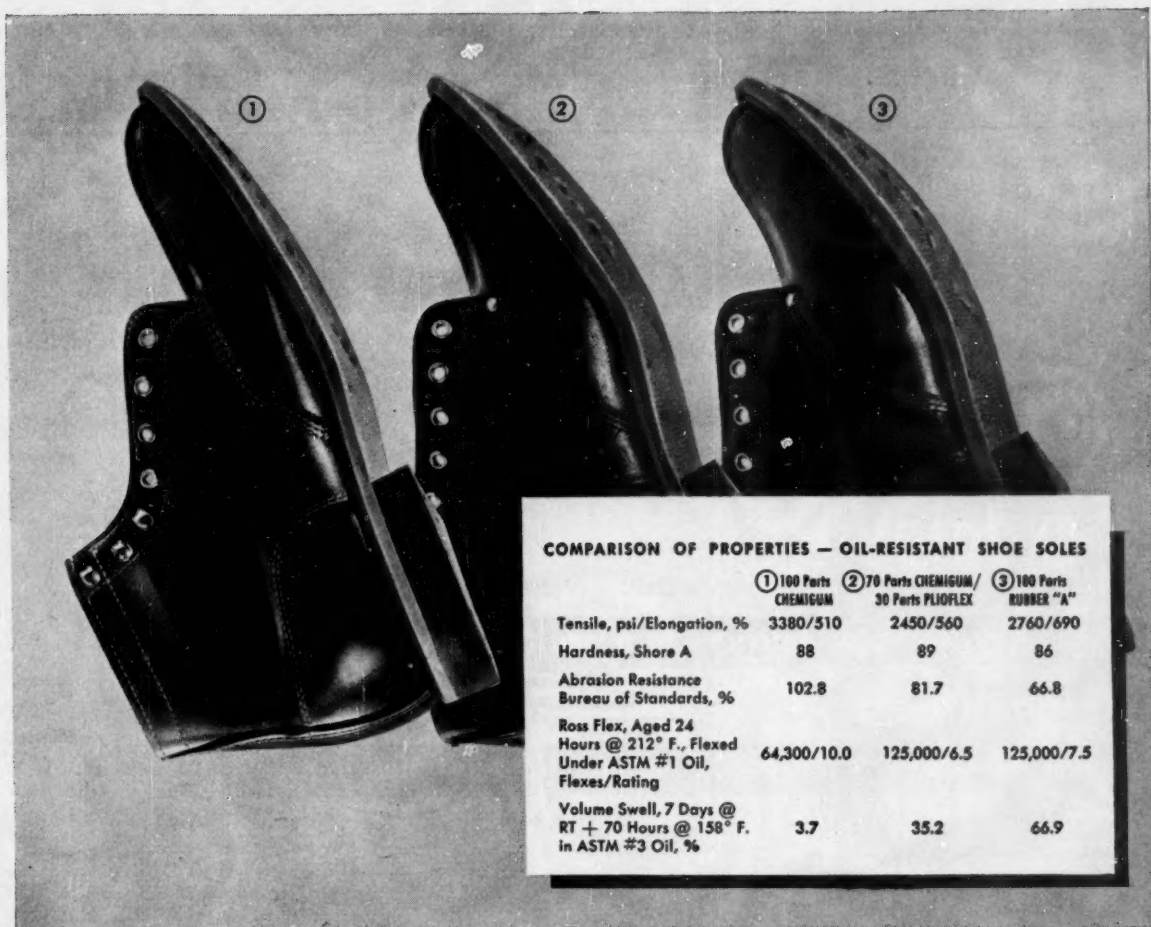


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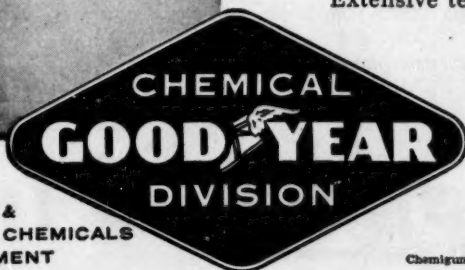
From these photographs and the accompanying data, it is evident that CHEMIGUM is the key to successfully combating the effects of oil and related products. CHEMIGUM alone offers the maximum in oil-resistance, without sacrifice of physical properties. CHEMIGUM plus PLIOFLEX offers a range of compounds to meet the most specific demands on costs or properties.

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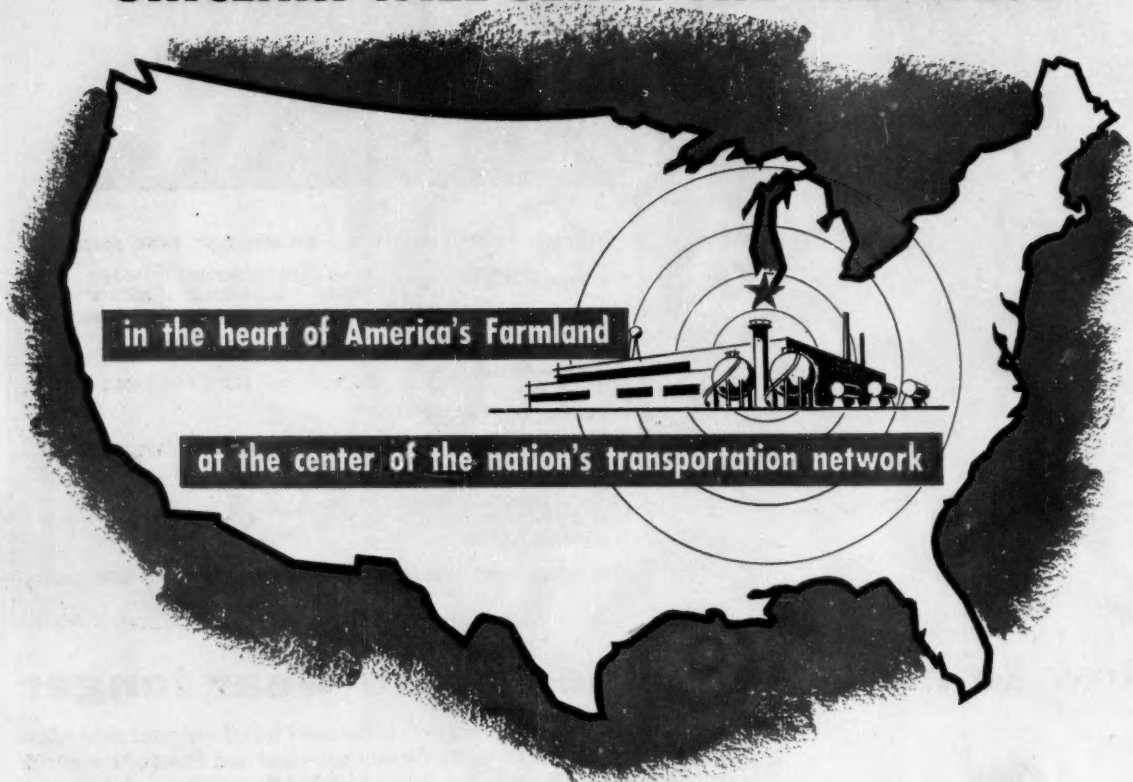
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Chemical Week

TOP OF THE WEEK

June 23, 1956

Thiokol is beaver-busy—issuing new stock, entering the butyl rubber field, blueprinting a deeper plunge into the rocket business p. 23

Coordinated development of satellite chemical industries bolsters Soviet strength p. 32

Researchers weigh early returns on cost, performance of cyanoethylated cotton p. 40

Paint makers switching to jels are hiking profits and prospects for T. F. Washburn Co. p. 50

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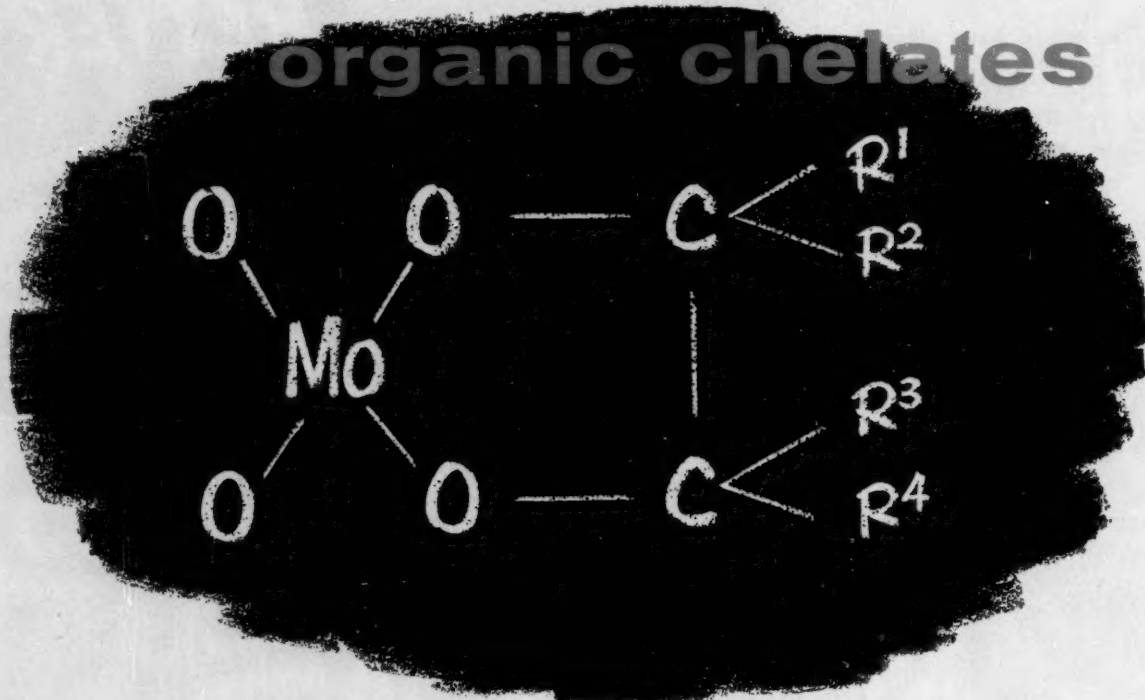
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CORPORATION**

38-15 30th Street, L. I. City, New York

MOLYBDIC OXIDE

—key to new family of

organic chelates



Molybdic oxide, MoO_3 , and the related molybdates, R_2MoO_4 , form chelates or complexes with many organic oxygen, sulfur and nitrogen compounds. Among these are:

Polybasic acids	Xanthates
Polyalcohols	β -diketones
Polyphenols	Aromatic bases
Thiophenols	Amines

Each of these classes of compounds forms a number of complexes with varying properties. For example, oxalic acid forms complexes with molybdenum in the +3, +4, +5 and +6 valence states. Some typical properties of these oxalates are described at right.

Mo^{III} oxalates are non-ionic. Examples are the water-soluble $\text{Mo}_2\text{O}(\text{C}_2\text{O}_4)_2 \cdot 6\text{H}_2\text{O}$ and the insoluble $\text{Mo}_4\text{O}_3(\text{C}_2\text{O}_4)_3 \cdot 12\text{H}_2\text{O}$.

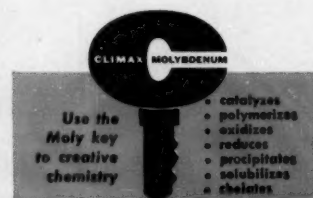
Mo^{IV} oxalates are both ionic and non-ionic. Ionic complexes of the type $\text{R}_2\text{Mo}_3\text{O}_4(\text{C}_2\text{O}_4)_3 \cdot 2\text{H}_2\text{O}$ are strong reducing agents. They are red in acid solution, blue in alkaline. Among non-ionic complexes are the purple $\text{Mo}_5\text{O}_6(\text{C}_2\text{O}_4)_4$ and the brown $\text{Mo}_4\text{O}_5(\text{C}_2\text{O}_4)_3 \cdot 10\text{H}_2\text{O}$, both soluble in water but insoluble in organic solvents.

Mo^V oxalates are highly colored. Salts of the type $\text{RMO}_2(\text{C}_2\text{O}_4) \cdot \text{H}_2\text{O}$ are red in concentrated water solution, but turn yellow on dilution. Mineral acids convert them to other highly colored compounds; for example HCl yields green complexes of the type $\text{R}_2(\text{MoOCl}_5)$. Other Mo^V complexes include the orange $(\text{C}_5\text{H}_6\text{N})\text{H} \cdot \text{MoO}_4\text{O}_8(\text{C}_2\text{O}_4)_4 \cdot 6\text{H}_2\text{O}$, the red $\text{K MoO}_2(\text{C}_2\text{O}_4) \cdot \text{H}_2\text{O}$, and the yellow $(\text{C}_5\text{H}_8\text{N})\text{MoO}_2(\text{C}_2\text{O}_4) \cdot \text{H}_2\text{O}$ and $\text{Mo}_2\text{O}_3(\text{C}_2\text{O}_4)_2 \cdot 4\text{H}_2\text{O}$.

Mo^{VI} oxalates are water soluble, but their amine salts are not. These complexes are apparently ionic.

Can you use these chelating powers of molybdenum? They are discussed more fully in a new bulletin, "Organic Complexes of Molybdenum". Write for it and for samples of molybdic oxide or sodium molybdate to Climax Molybdenum Company, Dept. 28, 500 Fifth Avenue, New York 36, N. Y.

CLIMAX MOLYBDENUM



Chemical Week

June 23, 1956

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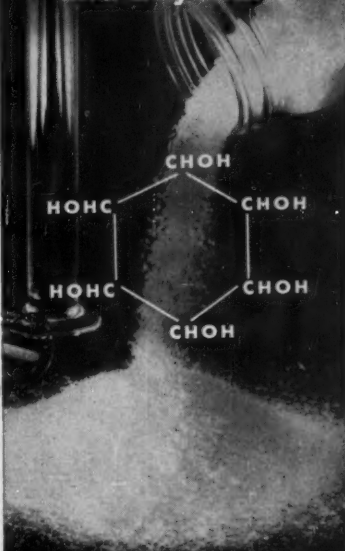
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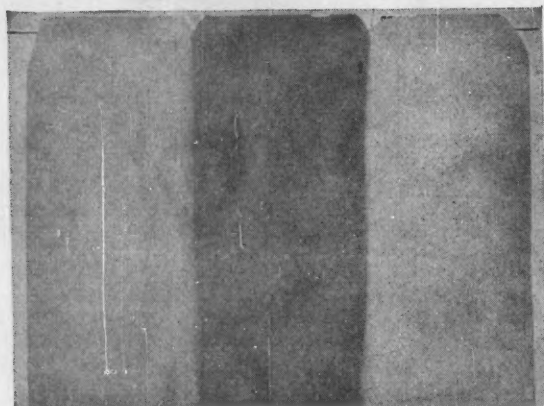
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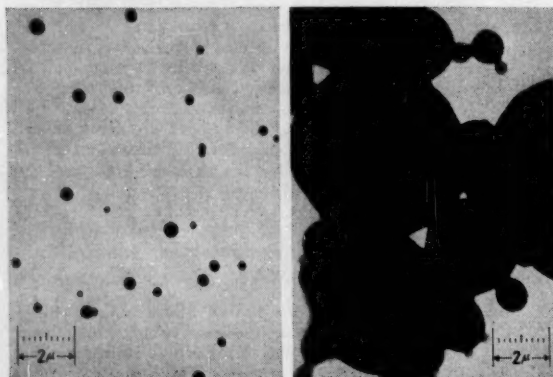


**"Is a copolymer
the only way to make
a good PVAc paint?"**



STANDARD HOMOPOLYMER CELANESE CL-102 STANDARD COPOLYMER

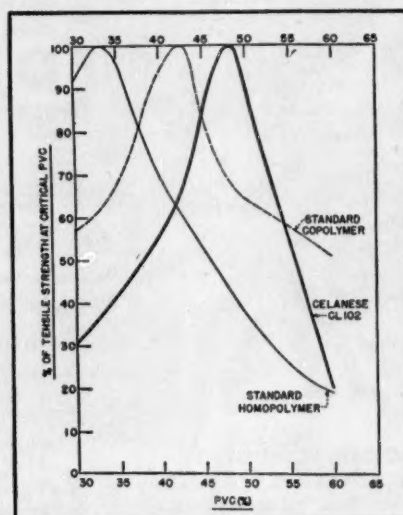
SUPERIOR PIGMENT WETTING. The three paints above were made on the same formula and tinted with equal amounts of an aqueous carbon black dispersion. Full color development was obtained in the CL-102 based paint, whereas flocculation occurred in the paints made with the standard homopolymer and copolymer. This demonstrates the extent to which the emulsifiers present in CL-102 aid in the dispersion of pigments thus providing an extra margin of safety against flocculation difficulties.



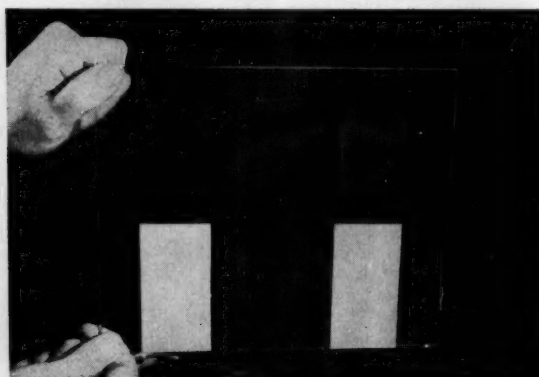
CELANESE CL-102

STANDARD HOMOPOLYMER

FINE PARTICLE SIZE. One of the more important reasons for the superior properties of Celanese CL-102 is its extremely fine particle size. This contributes to higher pigment binding, better non-settling characteristics, and tighter, more completely coalesced films.



HIGH PIGMENT BINDING. Celanese emulsions are designed as paint vehicles. Because of this they exhibit extremely high pigment binding capacity. The above graph was prepared by plotting the tensile strength of paint films at progressively higher PVC's. A standard formulation was used and only the emulsions differed. In this comparison, Celanese CL-102 exhibited a critical PVC even higher than the standard copolymer emulsion shown.



STANDARD HOMOPOLYMER

CELANESE CL-102

STANDARD COPOLYMER

SUPERIOR WATER RESISTANCE. Pictured above are three drawdowns of unpigmented PVAc films. (Both homopolymers plasticized with DBP.) The films were dried 72 hrs., then immersed in water for 5 min. The CL-102 film in the center maintains its crystal clear appearance and is substantially unaffected by the water.

**"No . . . now you can formulate quality,
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- Inherent flexibility—requires less external plasticizer
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Whatever your interest—homopolymer or copolymer—a Celanese technical representative will be happy to discuss the relative merits of these emulsions and assist you with your formulations.

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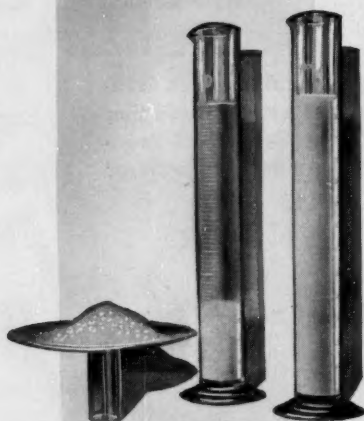
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OPINION

Move It Westward

TO THE EDITOR: We were pleased to see (May 19) a notice of our recent expansion . . . However we were disappointed in seeing that someone slipped in putting our address as Reading, Pennsylvania, instead of Reading, Ohio.

As we expand, it is important to us to have the industry thinking about us in terms of our correct location.

M. R. RALSTON
Carlisle Chemical Works, Inc.
Reading, Ohio

Notes from the Capital

TO THE EDITOR: . . . The article on San Francisco (May 19) is very interesting, but it omits reference to the substantial operations of Westvaco Division of Food Machinery & Chemical Corp., which processes our residual bitters in a large plant adjacent to ours at Newark on the lower end of the bay. This operation is an important factor in the chemical industry in the bay area, and is a fine example of diversification in the end-use of salt by-products.

SHELDON ALLEN
President
Leslie Salt Co.
San Francisco, Calif.

TO THE EDITOR: We were very impressed with the article "Chemical Capital of the Golden West" (May 26). It was particularly gratifying to note its accuracy and completeness. . . .

CHARLES A. ANDERSON
Asst. Manager, Industrial Dept.
San Francisco Chamber of Commerce
San Francisco, Calif.

Different Rubber

DEAR MR. JOHNSON: I would like to call your attention to an error in an article (April 21) titled "Raw Materials on the Masonry Wall." In the article, you state, "Top suppliers of chlorinated rubber are Du Pont and Hercules."

The type of chlorinated rubber you are referring to in your article is chlorinated natural rubber, and Hercules is by far the country's top supplier of this product. As far as we

know, Du Pont does not, and never has, made this product. . . .

FRED K. SHANKWEILER
Sales Manager, Coating Materials
Cellulose Products Dept.
Hercules Powder Co.
Wilmington, Del.

Du Pont's neoprene is, of course, a "chlorinated rubber," but we concede that it is quite different from Hercules Powder's product.—ED.

Carbide Process

TO THE EDITOR: Referring to your article "Putting Heat on Power" (May 12): Adding kerosene to fuming nitric acid and lastly charcoal (or coke) plus lime and liquid cellulose nitrate, when ignited, produces heat in excess of 4500 C (about 8200 F) and results in formation of a pure carbide in short order. (Liquid cellulose nitrate is a solution of common celluloid or pyroxylin in a mixture of about 45 parts of acetone, 50 parts of M.E.K. and 5 parts of dimethylformamide.)

LESLIE L. LINICK
W. Hollywood, Calif.

Annex Connecticut!

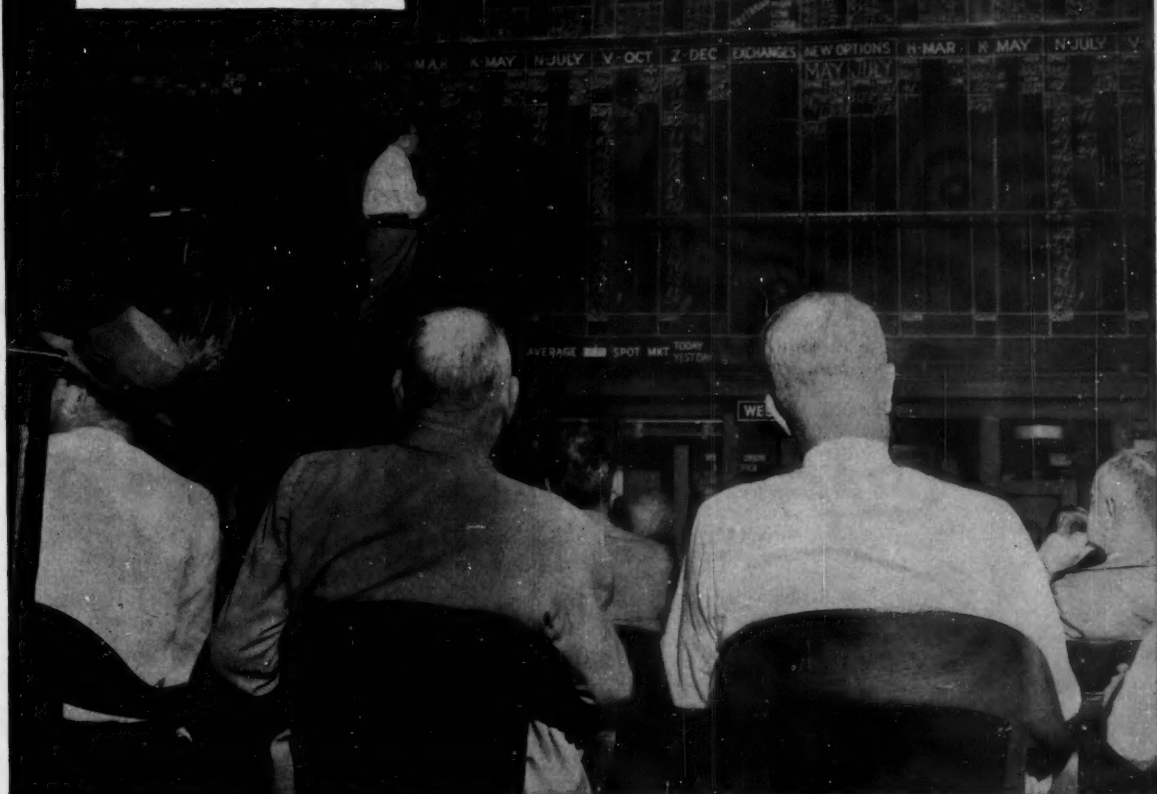
TO THE EDITOR: Dr. Ray Downs' proposal to annex Connecticut as Nutmeg County, Texas (CW, May 26) has many more advantages than he bothered to note. Here are the important considerations. Texas extends two of its major advantages: (1) its size, and (2) its natural gas, to its adopted county. It gets in return: (1) increased outlets for its chemical and agricultural raw materials and intermediates, (2) completely integrated manufactures from raw materials to finished products, and (3) additional seashore resort country.

The above are universal advantages to all Texans, although it will take some time before everyone gets

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to:
H. C. E. Johnson, Chemical Week,
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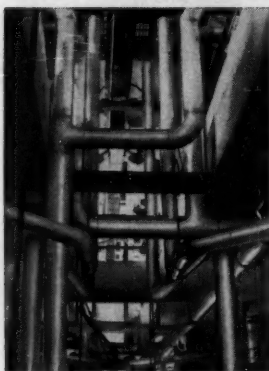


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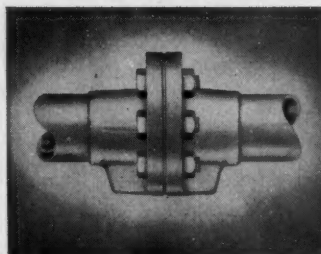
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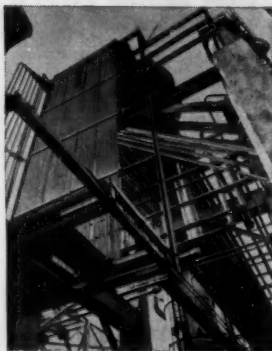
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Unitrace eliminates the cost of external steam jackets or steam tracer tubes because the steam line is an integral part of the aluminum pipe. It can cut your labor-installation costs by as much as 30%, and it will reduce (or even eliminate) the cost of thermal insulation for the lines.

The outstanding corrosion resistance natural to aluminum makes Unitrace ideally suited to the handling of naval stores, molten sulfur, ammonium nitrate solutions and other fluids normally requiring steam tracing. It lends itself to easy shop fabrication of standard lengths and can be formed with ordinary pipe-bending tools. A two-inch pipe size is standard and larger sizes are subject to special inquiry.

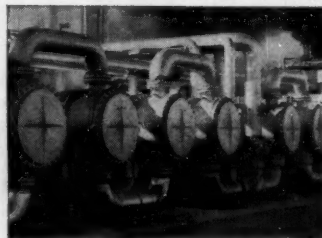
ALCOA® UTILITUBE



When the design calls for coiled tube, ALCOA Utilitube is best. It's economical to use . . . costing up to 40% less than copper tube. It is light, easy to handle and available in long lengths—up to 1,000 feet or more. Corrosion resistance is excellent.

ALCOA Utilitube has high fatigue and bursting strengths, it has good flaring and forming characteristics and work-hardens less under repeated bending. ALCOA Utilitube is used for instrument air lines, steam tracer lines, hydraulic and lubricating lines and refrigeration tubing.

ALCOA ALUMINUM HEAT EXCHANGER TUBES



Aluminum's natural resistance to oxidation and to corrosion by water, hydrogen sulfide, ammonia, carbon dioxide and many other compounds makes it an ideal material for heat exchanger tubes. Other important advantages are its high heat conductivity, light weight, ease of fabrication and low cost: 1/3 less than mild steel, 1/2 as much as Admiralty brass, 1/5 as much as Stainless.

IMMEDIATE DELIVERY—Each of these outstanding tubular products of ALCOA Aluminum is available for immediate delivery through more than 70 ALCOA distributor and jobber warehouses conveniently located throughout the country. Call on them for technical assistance in solving your pipe or tube problems. Rely on them to cut your investment in stocks and lower your handling costs . . . with deliveries geared to your requirements . . . from complete warehouse stocks of materials which will be cut to the exact sizes you specify.

For the name of your nearest ALCOA distributor or jobber, see the Yellow Pages of your telephone directory—or write ALUMINUM COMPANY OF AMERICA, 906-T Alcoa Building, Pittsburgh 19, Pennsylvania.



THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

Out of **BECCO**[®] epoxidation research...

olefin epoxides

3 now available in experimental quantities

Becco has developed novel epoxy compounds as a result of its extensive work in epoxidation reactions.

These epoxidized olefins combine a long-chain hydrocarbon structure with reactive epoxy groups and undergo reactions such as polymerization, isomerization, reduction and ring-opening with a variety of active hydrogen compounds.

The compounds offered are high assay epoxides:

	F.P.°C	B.P.°C	Density at 25°C	Solubility
OCTYLENE OXIDE mixed 1,2-and 2,3-epoxyoctanes	<-50	76-78 (45mm)	0.830	v. sl. soluble in water, soluble in hydrocarbons and other organic solvents.
DODECENE OXIDE 1,2-epoxydodecane	ca -10	97-98 (3.5mm)	0.836	insoluble in water, soluble in hydrocarbons and other organic solvents.
C₁₆-C₁₈ OLEFIN OXIDE mixed 1,2-epoxyhexa- decane and 1,2- epoxyoctadecane	ca 15	> 110 (0.5mm)	0.842	insoluble in water, soluble in hydrocarbons and other organic solvents.

POTENTIAL USES:

- (1) general solvent
- (2) solvent and diluent for epoxy resins
- (3) intermediate in manufacture of:
perfumeries, cosmetics, surfactants, plastics, lubricants
- (4) acid scavenger
- (5) corrosion inhibitor
- (6) stabilizer for chlorinated compounds
- (7) monomer
- (8) organic synthesis intermediate

We shall be glad to supply experimental quantities and technical assistance to chemical laboratories interested in possible applications of these epoxy compounds. Technical literature is also available. Your inquiry about other members of this series (C₄-C₂₄) is invited.

Becco also makes: Hydrogen Peroxide • Peracetic Acid • Sodium Perborate • Persulfates and other Peroxygen Chemicals.

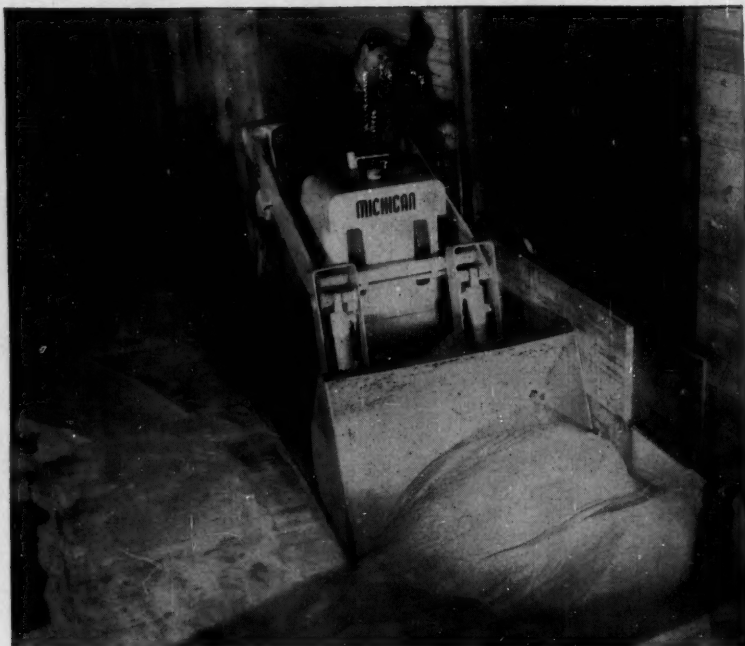
BECCO CHEMICAL DIVISION

Food Machinery and Chemical Corporation
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NEW YORK • PHILADELPHIA • VANCOUVER, WASH.



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Speeds cycles, cuts bulk handling costs... **Only the MICHIGAN 12B gives you power-shift transmission**

Power-shift transmission is standard equipment on the 15 cu. ft. MICHIGAN Model 12B—no engine clutch, no pedal, no gear clash. MICHIGAN is the only Tractor Shovel in this size range with power-shifting. Instead of wrestling with a conventional shift-lever and clutch pedal, the operator simply pushes a single lever on the steering column—like a modern car. High, low or reverse—make any shift instantly, even when travelling.

Entirely new power-train. For the constant stop-and-go, forward-reverse cycles of industrial bulk handling, Clark has designed and built an entirely new power-train for the Model 12B. This exclusive power-train is a completely integrated package, with each component matched to the others.

Torque converter multiplies engine torque up to 300%—provides the extra push to climb grades or penetrate tight material.

Power-shift transmission makes all

shifts hydraulically—cuts vital seconds off every cycle.

Planetary-wheel drive axle takes 70% of the torque load off the axle shaft—eliminates broken axles.

Not only does this power-train package make the MICHIGAN faster and easier to operate, it eliminates all the maintenance associated with an engine clutch and pedal. Furthermore, you deal with one single source for design, manufacture and service of all basic components.

Make your own comparison. The MICHIGAN Model 12B is simply more machine than any Tractor Shovel in its class. It is heavier and more powerful; it has low-level bucket action, complete dust protection features, and the exclusive Clark power-train. Before you buy an industrial Tractor Shovel, see this one in action. Write to arrange a demonstration of the MICHIGAN Model 12B on any job you name; clip the coupon to your letterhead and we'll do the rest.

Michigan is a registered trade mark of

**CLARK®
EQUIPMENT**

Arrange demonstration of Model 12B:
CLARK EQUIPMENT COMPANY
Construction Machinery Division
2459 Pipestone Road
Benton Harbor 30, Michigan

OPINION

around to utilizing item 3. Ray will automatically become a Texas citizen, but I do not believe he is pushing the deal only for this purely selfish motive. For example, I could again live in Texas and hold my present job. Many other Texans would be willing to work in New York under that condition, so the big city will be a major beneficiary.

Although Nutmeg is a bit smaller than it should be for a full-fledged Texas county, consummation of the proposal will be considered to qualify Ray as a Texas Wheeler-Dealer. I will take up with Gov. Shivers the matter of making it official.

JOHN GRISWOLD

(Texan now in exile)

Allied Chemical & Dye Corp.
New York

Products Not Only Aim

TO THE EDITOR: . . . I find the emphasis [in your report (May 19)] on "new products." Although important, I doubt that they are the only purpose [of research]. Often they are not the main benefit of research and development.

At Du Pont, for instance, the emphasis is on a great number of small improvements in processes and in old products. Small increments of gain in each single case, multiplied by hundreds or thousands of cases, are the main source of growth. Mr. Greenewalt recently had a very interesting article in *Fortune* along these lines.

LIONEL D. EDIE

Chairman of the Board
Lionel D. Edie & Company, Inc.
New York

P&G Sells, Too

TO THE EDITOR: We read the article "New Ideas in the Suds" (March 24) with a great deal of interest. . . .

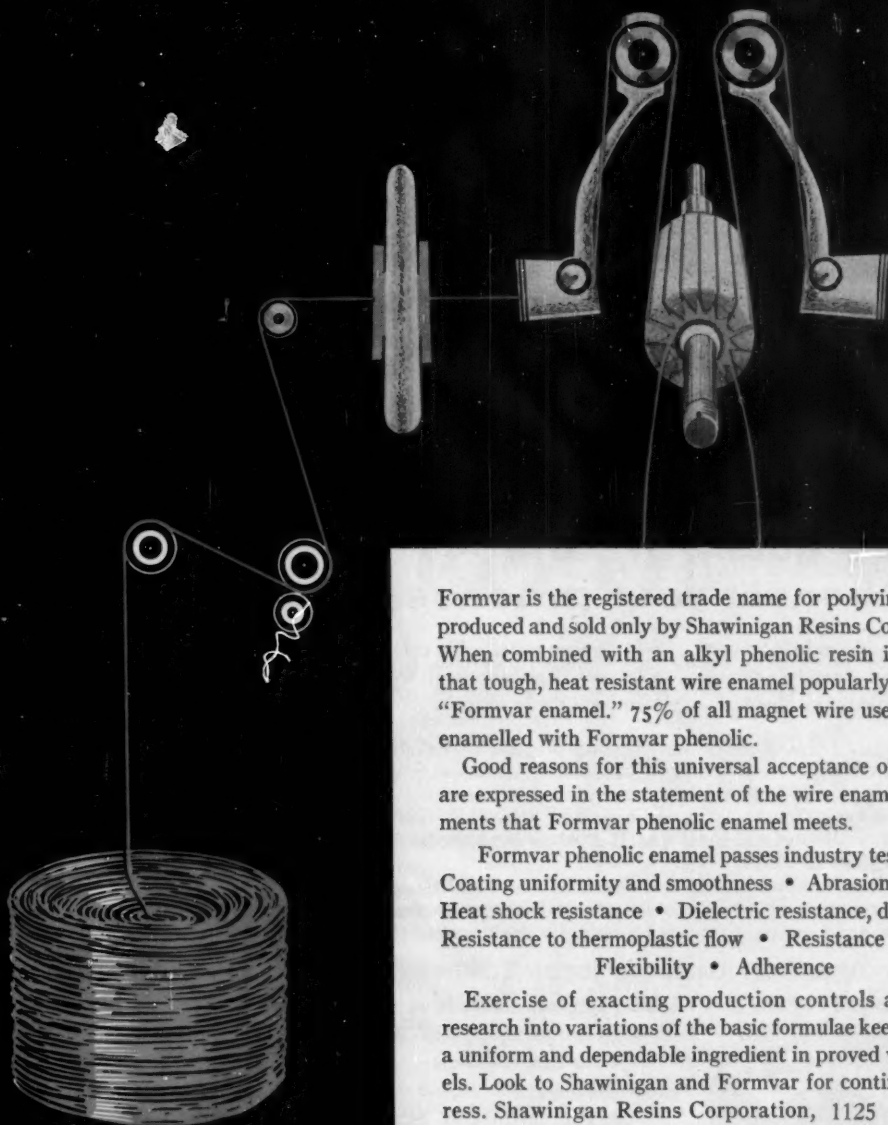
Under the section, "Three-Fourths of a Market," Procter & Gamble is referred to as a supplier of its own material. While this is true, we would like to point out that we have been a large supplier to other firms for many years and are very actively promoting the sale of our products to the cosmetic industry. . . .

T. J. WROCKLAGE

Manager, Bulk Soap Sales Department
Procter & Gamble Distributing Co.
Cincinnati, Ohio

FORMVAR . . .

the name everybody depends on!



Formvar is the registered trade name for polyvinyl formal produced and sold only by Shawinigan Resins Corporation. When combined with an alkyl phenolic resin it becomes that tough, heat resistant wire enamel popularly known as "Formvar enamel." 75% of all magnet wire used today is enamelled with Formvar phenolic.

Good reasons for this universal acceptance of Formvar are expressed in the statement of the wire enamel requirements that Formvar phenolic enamel meets.

Formvar phenolic enamel passes industry tests for:
Coating uniformity and smoothness • Abrasion resistance
Heat shock resistance • Dielectric resistance, dry and wet
Resistance to thermoplastic flow • Resistance to solvents
Flexibility • Adherence

Exercise of exacting production controls and active research into variations of the basic formulae keep Formvar a uniform and dependable ingredient in proved wire enamels. Look to Shawinigan and Formvar for continued progress. Shawinigan Resins Corporation, 1125 Monsanto Ave., Springfield 1, Mass.

FORMVAR® *for wire enamels by*



SODIUM BOROHYDRIDE NaBH₄



IN COMMERCIAL QUANTITIES



**AVAILABLE FROM
CALLERY CHEMICAL COMPANY**

Here are some applications where quality NaBH₄ can benefit your processing

- As a specific reducing agent
- To remove undesirable colors
- To remove trace impurities
- To remove heavy metals from solution
- As a deoxidizing agent
- To treat metal surfaces

These are just a few of many uses chemical processors are finding for this versatile product. Now available in commercial quantities from Callery Chemical Company, NaBH₄ has a number of characteristics that make it ideal for a variety of applications. It *reduces* aldehydes, ketones, esters, nitriles, carboxylic acid and metal ions. It is *soluble* in water, alcohol, amines and dimethyl glycol ethers.

Perhaps there are processes in your operation where NaBH₄ can improve your end-product . . . provide economies. Our staff is at your service. We will be happy to apply our eight years of experience to your particular problems.

OTHER CALLERY CHEMICAL BORON COMPOUNDS

- Amine boranes R₃N:BH₃
- Sodium Trialkoxyborohydride NaBH(OR)₃
- Methyl Borate B(OCH₃)₃
- Trimethoxyboroxine B₂O₃B(OCH₃)₃
- Sodium Tetramethoxyborate NaB(OCH₃)₄

Also—Potassium Metal and Sodium Potassium Alloy (NaK)
Available in drum or carload quantities

CALLERY CHEMICAL COMPANY
CALLERY, PA.

OPINION

Focuses Attention

TO THE EDITOR: [Re] the article (June 2) on catalysts and automobile gases. I think this is very timely, and while brief, nevertheless will serve to focus attention on this important problem. . . .

LEONARD GREENBURG
Commissioner

The City of New York
Dept. of Air Pollution Control

SEE YOU THERE

University of Denver and Atomic Industrial Forum, conference on uranium and atomic industry, Cosmopolitan Hotel, Denver, Col., June 25-26.

Stanford Research Institute and University of California, high-temperature symposium, Berkeley campus, Calif., June 25-27.

American Institute of Electrical Engineers, general meeting, Hotel Fairmont, New York (chemical sessions June 28), June 25-29.

International Conference on Nuclear Reactions, Amsterdam, Netherlands, July 1-7.

Symposium on Chemical Additives in Foods, 2nd of 5 symposiums, Amsterdam, Netherlands, July 9-11.

Society of Chemical Industry, 75th annual meeting, London, England, July 9-14.

Symposium on Synthetic Polymer Chemistry, Notre Dame, Ind., July 16-17.

Virginia Polytechnic Institute, 9th Oak Ridge Regional Symposium, Blacksburg, Va., July 30-31.

National Soybean Processors Assn. and American Soybean Assn., annual meeting, University of Illinois, Urbana, Aug. 13-15.

American Institute of Chemical Engineers, meeting, William Penn Hotel, Pittsburgh, Pa., Sept. 9-12.

International Congress on Catalysis, meeting, Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 10-14.

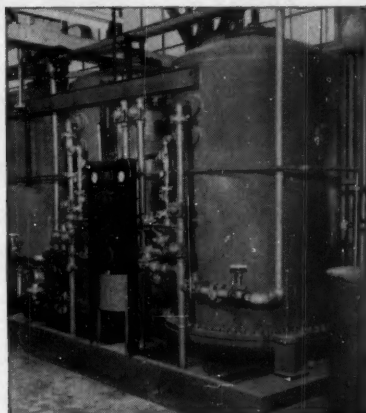
Federal Wholesale Drug Assn., meeting, The Greenbrier, White Sulphur Springs, W. Va., Sept. 16-19.

American Oil Chemists' Society, 30th fall meeting, Chicago, Ill., Sept. 24-26.

Drug, Chemical and Allied Trades Section of the New York Board of Trade, annual meeting, Pocono Manor, Pa., Sept. 27-30.

News about

B.F. Goodrich Chemical *raw materials*



Easy-to-install Geon rigid vinyl pipe lasts longer

THE exceptional physical and chemical properties of pipe and fittings made from Geon rigid vinyl resins have cut costs in many systems and made entirely new applications possible. Here are the reasons:

1. Resists oil, acids, alkalis, most chemicals.
2. Has high tensile and impact strength.
3. Resists sunlight, fungi, bacteria, moisture, heat and cold.
4. Smooth internal surface reduces flow resistance.
5. Rigid enough for overhead installation with pipe supports, but flexible enough to absorb shocks.

6. Easy to install. Lightweight (see photo), fittings attached by solvent cementing, threading, heat welding or adhesives.

7. Being a non-conductor, does not support electrolytic action.

Applications include sour crude oil lines, salt water lines, chemical plant piping, industrial cold water lines, vent pipes for acid fumes and corrosive gases. Vinegar plants, ships at sea, oil fields—all are enjoying the rewards of cheaper and easier installation, lower material cost and longer pipe life under extreme conditions.

Send for new bulletin on Geon 8700-A—describes properties, applications, advantages of rigid unplasticized polyvinyl chloride compounds. Write Dept. S-7, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.



Visit us at the Plastics Show! Booths 422-426.



GEON polyvinyl materials • NYCAR American rubber and latex • GOOD-RITE chemicals and plasticizers • HARMON colors

Shell Chemical announces—

EAK

ethyl amyl ketone

available now in  tank car
and tank truck  quantities!

New high-boiling active solvent for nitrocellulose and vinyl lacquers

Now ::: to bring you even more flexibility in formulating... the Shell "Quality Group" of lacquer solvents includes *ethyl amyl ketone*.

EAK holds more nitrocellulose in solution at a given viscosity than any other high boiler commonly used.

In formulating a high solids lacquer, EAK will give you a low viscosity solution with exceptional diluent tolerance. EAK imparts superior properties of blush resistance, gloss and flow-out to coatings for wood or metal.

For automotive lacquers and thinners, EAK reduces the amount of rubbing, provides excellent gloss, thus adding to showroom appeal.

For furniture lacquers, hot or cold spray, EAK provides good flow-out, leveling, blush resistance and freedom from bubbling.

EAK has proved outstanding in making industrial maintenance vinyl lacquers, because of its high solvent power.

In silk-screen printing lacquers, EAK gives freedom from screen-clogging.

EAK has now taken its place in the family of Shell quality lacquer solvents that includes MEK, MIBK, and acetone. Write for technical bulletins for many suggested formulations.

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Business

Newsletter

CHEMICAL WEEK
June 23, 1956

Don't think there'll be a steel strike just because the United Steelworkers has interrupted bargaining with the "Big Three" steel companies. If you sell chemicals used in steel production, or buy coal tar derivatives, don't be stampeded into rash action. It's all part of the show.

But don't look for a quick settlement, either, now that eight more steel companies have been called in for bargaining. None of them would make any concessions that a larger company refused. The Big Three—or U.S. Steel itself—will still set the pattern.

Odd's are that the final settlement will include these items:

- A two- or three-year contract without a reopening clause. The industry's proposal of a five-year pact was made for bargaining purposes; industry isn't happy about the current two-year contracts which allow unions to negotiate a further wage rise at the beginning of a contract's second year.
- A pay boost equal to 18-20¢/hr. for the first year. An additional productivity increase, plus an allowance for increases in the cost of living, would be granted in two- or three-year contract.
- Supplementary unemployment benefits essentially parallel to those gained last year from the big automobile manufacturers.

And what the steelworkers get, your workers will demand.

•
A deadline last Friday, however, may have as much importance to chemical executives as the forthcoming deadline for steel wage talks. Officials at the Treasury Dept. in Washington are just beginning to open the envelopes containing the second of two income tax installments paid by all U.S. corporations. The payments were due June 15. If the receipts are higher than anticipated, there's a chance of a tax cut this year. You can look for the first unofficial reports to start filtering out of Washington early next week.

•
There were contrasting plant expansion decisions this week on polyethylene.

While Union Carbide will add 55 million lbs./yr. of new polyethylene capacity (see p. 65), Farbwerke Hoechst is withdrawing as a potential producer in Brazil. Reason: too much prospective competition.

•
The government has offered a compromise in its battle to keep secret the grand jury minutes of the soap antitrust case. It has agreed to provide Colgate-Palmolive, Procter & Gamble and Lever Bros. with the names of jury witnesses so they can take depositions. But the defendants, who got an order from Judge Alfred Modarelli opening the records to them, say this isn't enough, because what the witnesses say today may not be the same as what they told the jury in 1951-52. Judge Modarelli will think over the government's request.

Business

Newsletter

(Continued)

The Cosden Petroleum-W. R. Grace merger is off. And the decision came on what, to some observers, was a side issue—the proved oil reserves of Cosden. When some independent consultants estimated that the reserves were below the minimum stipulated in the tentative merger agreement, Grace offered Cosden a lower price which Cosden's board refused.

Some substantial Cosden stockholders, reportedly including one director, had felt that even Grace's original offering price (*CW Business Newsletter*, May 5) was too low.

Mineral reserves and rights are also in the news in Arkansas. American Colloid (Chicago) and Dierks Forests (Kansas City) may join in building a half-million-dollar barite plant near Nashville, Ark. Dierks, which has just begun construction of a \$25-30-million kraft paper mill at Pine Bluff, Ark., has extensive forest and mineral holdings in Arkansas and eastern Oklahoma.

And one upcoming Spencer Chemical project may also involve minerals. Chemical trade in Salt Lake City identifies Spencer as a company that is checking into mineral lease applications covering 912 acres near Saltair, Utah. The applications, filed by John D. Archer of Salt Lake City, cover acreage said to have deposits that run to 30% in sodium sulfate values.

Spencer, itself, says that while it looked over the applications, it has no current interest in the project. But, in addition, it reports its interest was not in salt cake value—but in another mineral.

Northwest Florida has been picked by Cyanamid for its fiber plant. The company has tentatively selected a site at Milton, 20 miles northeast of Pensacola, for construction of a plant to make 27 million lbs./yr. of its Creslan acrylic fiber (*CW*, June 2, p. 17). One indication of company hopes for the fiber: it's already planning for an eventual doubling of capacity. It will use acrylonitrile from its Fortier, La., plant, be onstream in the second half of 1958.

Cyanamid's site is adjacent to the 2,100-acre holding of Escambia Bay Chemical, and only six miles from Chemstrand's nylon salt and fiber units.

What will the plant cost? Cyanamid isn't saying. But trade observers feel that a \$25-30-million figure would be a pretty good guess.

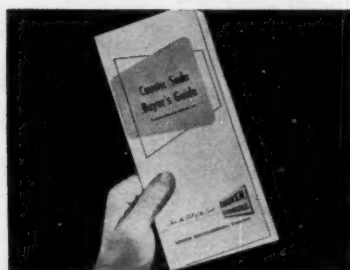
How strong are the Virginia-Carolina insurgents? At their long-awaited (and well advertised) meeting with the V-C board in Richmond last week, they claimed support of 65% of the common stock and 14% of the preferred—slightly over 50% of the total of common and preferred stock. Holders of each series will have equal voting rights at a special stockholder meeting July 18.

Meanwhile, management forces are not inactive. They've retained a proxy-soliciting firm, Georgeson & Co., and a public relations counsellor, Salvage & Lee.

BRIEFS

for buyers of

Caustic Soda
Muriatic Acid
Aluminum Chloride



What strength caustic should you buy?

This new booklet gives facts every buyer should know about caustic soda.

It contains a handy nomograph to help figure for yourself whether 50% or 73% caustic is your better buy.

Contents include a list of reasons *pro* and *con* switching to 73% caustic if you are now using 50%. There's a factual discussion of the economics of 73% vs. 50%.

The booklet also contains a nomograph for estimating your liquid caustic requirements for various process solution strengths; a table showing dimensions and capacities of the different containers in which Hooker caustic soda is shipped; and a list of points to look for when you're choosing a caustic soda supplier.

Check the coupon at right for your copy (or write us if you'd like more than one).

High-purity HCl.

Probably the purest muriatic acid you can buy in volume anywhere is Hooker White.

This special-grade muriatic is entirely free of arsenic. It contains .003%

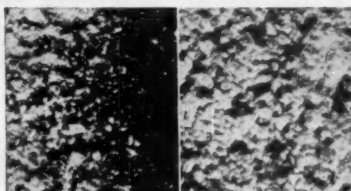
or less sulfates, and .0001% or less iron.

Leading pharmaceutical firms are among those who specify Hooker White when they want a highly pure starting material.

If your requirements are slightly less stiff, we recommend Hooker commercial grade muriatic. This grade is entirely arsenic-free, and has very low sulfate and iron content.

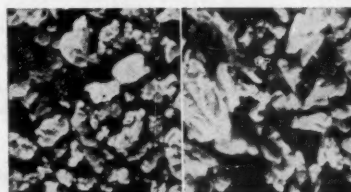
Both grades are available in 18°, 20°, and 22° Baumé. Muriatic acid is shipped in rubber-lined tank cars and 13-gal. glass carboys.

For technical data sheets, check the coupon.



EXTRA FINE GRIND

FINE GRIND



COARSE GRIND

COARSE SCREENED

Catalyst control.

Surface area of a solid catalyst, such as aluminum chloride, of course bears an important relationship to reaction rate.

That's why we make aluminum chloride in four different mesh sizes (shown above, actual size). You can

get close control of reaction and feeding rates by specifying, from the following list, the size that best fits your process:

1. Extra fine grind (90-95% through 40 mesh).
2. Fine grind (almost all through 20 mesh).
3. Coarse grind (through 1 mesh, 25-35% through 20 mesh).
4. Coarse screened (through 1 mesh, on 20 mesh).

This material is a grayish crystalline solid containing 98.5% $AlCl_3$ in coarse sizes, 97.5% in fine sizes, with maximum iron content of 0.05%.

It is shipped in the following containers:

5-gal. pails	50 lbs. net
10-gal. removable head drums	100 lbs. net
55-gal. removable head steel drums ...	550 lbs. net

For technical data, check the coupon.

For more information

on items mentioned here, check below.

- ☐ Aluminum Chloride, anhydrous
- ☐ Caustic Soda, liquid (50% and 73%)
- ☐ Muriatic Acid

Do you process with any of these compounds? The list below is only partly representative of high-quality materials available in quantity at Hooker. Check those on which you'd like more information.

- ☐ Antimony Trichloride, anhydrous
- ☐ Benzotrichloride
- ☐ Benzoyl Chloride
- ☐ Benzyl Chloride
- ☐ Benzyl Thiocyanate
- ☐ Butyryl Chloride
- ☐ Caprylyl Chloride

Clip and mail to us with your name, title, company address.



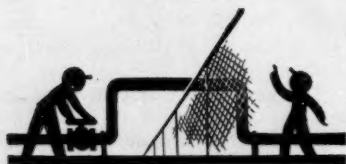
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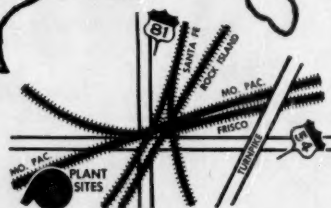
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B-1793

Consider these advantages to locating your next plant



OVER-THE-FENCE deliveries of chlorine, caustic soda, hydrogen chloride.



EXCELLENT LOW-COST TRANSPORTATION in all directions.



UNLIMITED natural gas and petroleum virtually at your doorstep.



345,000 KW of low-cost electricity from new power station at plant sites.



STRATEGIC LOCATION at the heart of agricultural America.



FAVORABLE POLITICAL AND ECONOMIC climate for industrial growth; intelligent, productive, 97% native born American labor.

Producers of

CAUSTIC SODA LIQUID, FLAKE, SOLID

MURIATIC ACID

CHLORINE

CHLORINATED SOLVENTS

BENZENE HEXACHLORIDE

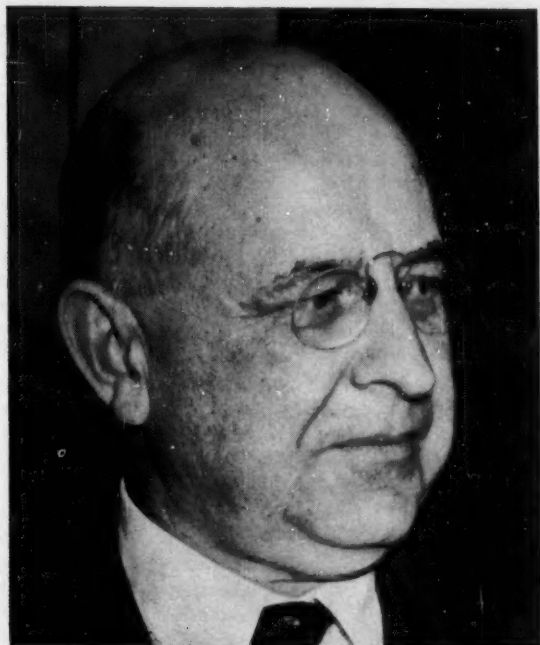
99% PURE SALT FINE GRAIN AND BRIQUETTE

WE SHALL WARMLY WELCOME good neighbors to share these advantages with us. Please call on us for any help we can extend in your planning.



DIVISION OF UNION CHEMICAL & MATERIALS CORP.

EXECUTIVE AND GENERAL OFFICES, MUNICIPAL AIRPORT BUILDING, WICHITA, KANSAS
WICHITA, KANSAS • DENVER CITY, TEXAS • DUMAS, TEXAS • MIDLAND, TEXAS



WON: Reed's "no monopoly" finding.

"Du Pont produced almost 75% of the cellophane sold in the United States [during 1923-47]," said Justice Stanley F. Reed, for the court majority. But he pointed out that sales of cellophane "constituted less than 20% of all 'flexible packaging material' sales . . .

"The burden of proof, of course, was upon the government to establish monopoly . . . [the defense], that cellophane was merely a part of the relevant market for flexible packaging materials . . .

"A very considerable degree of functional interchangeability exists between these products . . .

"This flexible packaging market . . . has many producers and there is no proof Du Pont ever has possessed power to exclude any of them from the rapidly expanding flexible packaging market . . ."



LOST: Warren's plea for toughness.

"The majority virtually emasculate section two of the Sherman [Anti-trust] Act," replied Chief Justice Earl Warren, for the dissenters, in defining the market in which Du Pont's economic power is to be measured . . .

"They admit that 'cellophane combines the desirable elements of transparency, strength and cheapness more definitely than any' of a host of other packaging materials. Yet they hold that all of those materials are so indistinguishable from cellophane as to warrant their inclusion in the market. We cannot agree. . . .

"The record shows conclusively that cellophane is the relevant market. Since Du Pont has the lion's share of that market, it must have monopoly power . . ."

Coming: New Rule on Trusts

The Supreme Court's decision clearing E. I. du Pont de Nemours & Co. of cellophane monopoly charges has changed a basic interpretation of the Sherman Act—the 1890 law that's the foundation of most U.S. antitrust judicial procedure.

The decision for Du Pont and against the government's Justice Dept. is a legal landmark; it will haunt the government again and again in future antitrust litigation.

Specifically, the court said that the issue wasn't how much of the cello-

phane market Du Pont controlled (*CW Business Newsletter*, June 16), but how much of the flexible wrapping material market it held. And Du Pont's sale of 75% of all cellophane—in the 1923-1947 period with which the case dealt—turns out to be only a small fraction—17% or less—of the total market for wrappings.

Patents Unsettled: The court

leaves unsettled the important patent issue in the case. Du Pont argued its market position in cellophane was based on patents and thus was immune from antitrust attack. The government argued that Du Pont originally entered the market under illegal restraints of trade (through agreements with the French developers of cellophane in 1923) which its later patents on moistureproof cellophane did not legalize.

The court said it would not examine this part of the case at all—or Du Pont's other argument that its position was immune from attack because it was attained through "business expertness." The court's reasoning: if the wrapping market is considered as a whole, the company does not have monopoly power anyway.

Fears and Hopes: Justice Dept. antitrust lawyers for months have feared—and company lawyers have hoped—that the court might come to this decision. The antitrusters worry that this line of reasoning might—as Chief Justice Warren and two other

justices insisted—"virtually emasculate" the antitrust laws.

They visualize that it may be almost impossible to prove monopoly under the Sherman Act, and almost impossible to prove that even an admitted monopoly of a specific item has an adverse affect on competition.

Can it ever be said again, they wonder, that a company monopolizes aluminum, since it competes with other metals, wrapping materials, building materials and the like for a variety of uses?

The majority of the court was well aware of this. In fact, Justice Reed in his opinion suggested that each case of this kind is different. He seemed to be warning that the court in cases that seem similar might decide the other way. The closeness of the vote on cellophane—4 to 3—underscores the point. (Justices Clark, who filed the case, and Harlan, one-time Du Pont attorney, did not participate.)

Reed had no argument with earlier Supreme Court antitrust decisions

which held that, under the Sherman Act, control of price or competition establishes monopoly power.

And Reed admitted that if cellophane were the "market" to be considered, Du Pont did "have monopoly power in that market."

But Reed went on to hold that determination of the relevant market for commodities under the antitrust laws depends on how different they are in character or use and how far buyers will go to substitute one commodity for another. Where a product is controlled by one interest, without substitutes available in the market, there is monopoly power, Reed said. But where there are market alternatives that buyers readily use, illegal monopoly does not exist merely because the product said to be monopolized differs from others.

The New Rule: Reed then set up the rule on what market must be studied to decide when a producer has monopoly power:

Such a market, he said, "is composed of products that have reasonable interchangeability for the purposes for which they are produced—price, use and qualities considered."

Reed admitted the rule is not very definite, that the market will vary from case to case, and that application of the tests of monopoly power in any one market will remain uncertain. But the decision does make this the rule.

"Good Monopoly": To the dissenters, Du Pont was at best only a "good monopolist"—it did not use predatory practices or seek profits by raising prices. But, says Warren, "proof of enlightened exercise of monopoly power certainly does not refute the existence of that power."

Warren voiced the antitrusters feeling by declaring that the cellophane case shows that the court's new formula of reasonable interchangeability is "perfectly compatible with a fully monopolized economy." He chides the majority for saying brick, stone, wood and steel are too different to be in the same market, while holding that cellophane, glassine, wax papers, aluminum foil and a host of other wraps are not too different.

Warren thus pinpoints the problem antitrusters face from now on in every monopoly case they file. If the market can be broadly drawn, it may be impossible ever to prove monopoly.

More Big Antitrust Decisions Ahead

The Supreme Court faces more big antitrust decisions next year. It will decide whether the government has proved that Du Pont's 22% stock ownership of General Motors resulted in illegal control of the motor giant and whether the Du Ponts—family and corporation—followed an illegal pattern to protect markets for Du Pont products and exclude competitors from supplying GM. A lower court ruled against the government.

Another case involves the Federal Trade Commission's appeal in the lead pigment zone-delivered price-fixing case against National Lead and others. FTC proved its conspiracy charges. But though a federal court said that FTC could forbid collective use of a zone-delivered pricing system in the industry, it decided that FTC had no authority to ban use of such a system by each individual company involved. FTC says this is necessary to stop and prevent "revival" of the conspiracy between the companies to match each other's prices.

Chief Responsibility: As chemical executives evaluate court actions on antitrust matters, they are noting that Chief Justice Warren is voting time after time with Justices Black and Douglas, considered the solid New Deal liberals on the court.

Two weeks ago, he joined them in four cases—all involving state supreme court decisions that Warren thought should be upset. One of these—by the California supreme court—upheld Cutter Laboratories' dismissal of an employee on grounds of his being a communist.

Last week, Warren again dissented in four cases with Black and Douglas. His dissent in the cellophane case—and his majority opinion in the McKesson antitrust case (page 88)—puts him squarely on record as a really tough proponent of the antitrust laws.



PRESIDENT CROSBY, with investors Rydell, Lang. They're piloting Thiokol toward a . . .

Rocket Payoff

Last week, Thiokol Corp. (Trenton, N.J.) floated its biggest issue of stock in 13 years—to help build a large new rocket research center near Ogden, Utah.

Choosing the equity route for its expansion financing, Thiokol is offering 64,605 shares of common stock to present stockholders, on the basis of one share for every six now held. Recent quotations for Thiokol peg the gross revenue from the offering at more than \$2 million.

The company will use about \$500,000 to pay off bank debts; the rest will be channeled into its \$2-million Utah rocket center, slated for startup by Jan. 1, '57, with full-scale operation scheduled for July.

Propellant Contributor: Thiokol has been one of the chief contributors to solid propellents for rockets since World War II; the Utah facility will plunge it even further into the field—with, perhaps, fewer government controls over researchers. The company now operates government-owned rocket facilities at Longhorn Ordnance Works (Marshall, Tex.) and Redstone Arsenal (Huntsville, Ala.). Thiokol pays no rent, is reimbursed for maintenance costs. The Utah unit, on the other hand, will be financed entirely by private capital, will be wholly owned by the company.

Full company ownership stems partly from the different interests among the three armed service branches. Observers say that Thiokol

will now be able to concentrate on any phase of rocket research and development it thinks feasible, without having to meet the needs of a single service more than another—an alleged problem in Longhorn and Redstone operations. The three services will still be major customers.

Another reason for building the Utah center is the military need for larger solid propellant motors, production of which requires greater plant areas. The company's own rocket center in Elkton, Md., will be small by comparison with the Utah unit.

Change to Solid: The swing in the missile and rocket field has been toward solid rather than liquid propellents. It's firm now that the earth satellite (Thiokol had bid for this project but lost out to a competitor), to be launched sometime next year, will use a solid propellant. Reasons: solid fuel is more compressible than liquid, and operating requirements are easier, since fuel pumps or complicated mixing equipment is unnecessary.

Though Thiokol's main interest is in rockets (\$8 million sales), it has a \$5-million/year chemical division, with plants in Trenton, N.J., and in Moss Pt., Miss. The company maintains strong research; last year about 9% of industrial sales revenue was spent for research.

And Petroleum Chemicals, joint subsidiary of Cities Service and Continental Oil, has lured Thiokol to investigate new uses of butyl rubber

and help in market development. If successful, Petroleum Chemicals will build a plant for butyl in Lake Charles, La., at a reported cost of \$25 million. License to produce butyl has already been granted to Petroleum Chemicals by Esso Standard Oil, which owns the patents.

Present Research: Right now, most research is directed at production of liquid polymers, such as polysulfides, polyurethanes. Many of these polymers can be cured without heat to a rubbery substance with almost any desired hardness, and are used as caulking compounds in buildings and for sealing fuel cells on airplane wings. One major company is reportedly exploring the possibility of using the polymers for sealing pipeline connections.

Another recent Thiokol development is a hydrophilic polyurethane foam, a "first" for the company since all other polyurethanes developed so far do not sponge up water efficiently. With this new product, Thiokol hopes to enter the chemical specialties market. Simultaneously, it is piloting several organic sulfur compounds, which it will soon produce on a commercial scale.

Stock Rise: Earlier this year, Thiokol attracted attention when its stock zoomed from \$22 to \$49 per share in a period of a few weeks. Moreover, there were rumors of merger with several large companies, among them Olin Mathieson and Union Carbide. But such a merger won't go through, according to President Joseph Crosby and his associates, Broker Ralph Ry-

dell and the principal stockholder-director, Robert Lang.

"We were approached by several representatives of large companies," Crosby reports, "but after discussion, all parties agreed that merger would not sufficiently benefit Thiokol stockholders. We feel that we can develop satisfactorily on our own."

Rather than be acquired, Thiokol is contemplating some acquisitions of its own. Though there's nothing definite now, the company would like to buy a specialties firm somewhat in line with its present industrial output.

"But," says President Crosby, "it's not easy to find one at the right price these days." In any case, Thiokol plans to keep forging ahead in rockets and guided missiles; it feels that this, together with the expanding industrial chemicals division, definitely dubs it a "growth" company.

COMPANIES

Du Pont of Canada Securities Ltd. has submitted a proposal to its shareholders to transfer the business and operations of its subsidiary, Du Pont of Canada, Ltd., to the parent company. The name of the company would be changed to Du Pont Co. of Canada (1956) Ltd.

Republic Steel Corp. has completed arrangements with the Crane Co. (*CW*, Feb. 4, p. 13) to take over a half interest in Cramet, Inc., which has been Crane's wholly owned titanium-sponge-producing subsidiary.

National Gypsum Co. is offering subscription rights to common stockholders for 417,403 additional shares of stock at \$47 a share, on the basis of one new share for each eight held.

Interchemical Corp. has acquired the industrial adhesives business of Angier Products, Inc., through exchange of Interchemical common stock.

Mersey Paper Co., Ltd., shareholders meet this week to vote on sale of part of its properties to Bowater Corp. of North America. Terms are undisclosed. Bowater will locate a new pulp mill on Mersey's Nova Scotia property.

"How to" for Small Firms

While getting a bank loan is almost a routine matter for big chemical companies like American Cyanamid, Union Carbide or Allied Chemical—"prime risks" to bankers—a small, young or essentially unknown company may find bank borrowing more of a challenge.

Indeed, since financial people seem to have difficulty pronouncing the names of common chemical compounds, it is often difficult for a small company to convince a banker that it deserves a loan.

A man with a background in both chemicals and banking, Empire Trust's chemical vice-president, Dick Schneider, last week gave SOCMA members in New York this outline of the steps a small company should take.

Schneider's First Key: Plenty of advance preparation by company executives is mandatory even before the first conference with the company's banker. To get a loan for a plant expansion, the company should be able to prove to a banker (1) that there is plenty of raw material available, (2) that all processes used are free from possible patent infringements and (3) that processes used are economically competitive.

New Market Ahead: If a company wants a bank loan to expand into a new market, Schneider suggests that the borrower prepare, or have prepared, a complete survey of that market. If the product can be sold on a long-term contract, it would be well that at least part of planned output be contracted for.

If the process to be used is new or novel, it is often a good thing, Schneider asserts, to have an opinion of it from an independent engineering organization. Prepare a summary of education and previous business experience of top individuals—and, where a company is already in business, a record of earnings for at least the past two years.

Two Objectives: Such information is needed for each of the two main types of bank loans—for working capital, or term loans to finance new plant. Working capital loans are generally easier to get—if a company's record is sound. Of course, many factors must be considered. Among them: a company's inventory turnover, its collection of accounts receivable,

purchase and sales terms on what it buys and sells, seasonal and cyclical changes in business, and, above all, the amount of surplus that a company's management wants for protection against contingencies of any kind.

For a term loan, normally for not more than four years, a company needs not only an adequate financial statement, but also well defined plans to conduct its business to get the cash income it needs to pay off the loan. (This may include a sales contract for part of a company's output.)

Other Aids: Too, a bank may be able to help companies with longer-term financial problems. Banks sometimes work with an insurance company to give companies long-term loans. The bank can take the shorter-term payments, and the insurance company the later ones, since such firms usually prefer loans that run 10 years or longer.

Schneider also pointed out that bank activity in investment advisory services can lead to giving advice on combining term bank loans with a private stock placement. Such placement "can on occasion be somewhat cheaper" than a public offering of the stock.

EXPANSION

Aluminum: Canadian British Aluminium, Ltd., and Quebec North Shore Paper Co. will join in construction of a smelter at Baie-Comeau, Que.

Ethylene: Imperial Oil Co. is planning an ethylene plant (estimated cost: \$10-12 million) in the Sarnia, Ont., chemical valley.

Gypsum: Flintkote Co. has announced it will start construction of a gypsum processing plant—part of a \$20-million expansion program—at Sweetwater, Tex., in the next few months. Expected start-up: 1957.

Ammonia: Petroleum Chemicals, Inc., will build a 300-tons/day ammonia plant at Lake Charles, La. The \$12-million plant, to be designed and built by Foster Wheeler Corp. is scheduled for completion in 1957.

Petrochemicals: Lake Charles Chemical Corp. has awarded a \$6.2-million

Washington Angles »

» **Publicker may have won a hollow victory** in its fight to have Union Carbide's purchase of the Louisville butadiene plant vetoed by Congress. The House Armed Services Committee is re-writing the rules for another try at disposal next year—but with a difference. It will allow sale without regard to the synthetic rubber industry. Under the new bill, if a prospective owner is making any chemicals useful to defense there, it won't have to reconvert to make butadiene in wartime.

With this obligation of costly conversion eliminated, the disposal commission figures Carbide and other chemical firms can afford to bid lots more. Publicker, which can use the plant only for butadiene, won't be a serious contender on that basis.

» **Freeing industrial alcohol makers and users** from rigid government controls on their operations may come this year. The House is expected to approve the recodification of the alcohol tax laws voted by its Ways and Means Committee last week—though a Senate vote before 1957 is less sure. Present rules lump industrial and beverage alcohol together.

The new code won't mean less federal regulation of beverage makers but will put industrial alcohol plants on a largely self-policing basis.

» **Congress will hold back this year** on starting to move the National Bureau of Standards out of Washington and into a new \$40-million suburban Maryland home. The agency wants \$2,750,000 now to buy land and hire architects, but the most it can expect at this time is a small fraction of that sum.

» **Another boost for tranquillizing drugs** came last week from the Veterans Administration's big Northampton, Mass., hospital where discharges of mental patients jumped 36% after the calming drugs were used. The V.A. is now planning a massive evaluation of these drugs, has invited 51 of its hospitals and clinics to participate.

» **A new stream pollution law** is definitely in the cards, after its lopsided approval by the House last week. Odds favor the Senate's bringing its previously passed bill into line with the House version.

But both include the provision—opposed by the Manufacturing Chemists' Assn. and some other groups—that allows federal officials to take court action against polluters at the request of a down-stream state when pollution crosses state lines.

contract to the Fluor Corp. to build a 10,000-bbls./day delayed coking and calcining unit which will be physically integrated with Continental Oil Co.'s Lake Charles, La., refinery. Expected completion: about Sept. '57.

• **Bromine Compounds:** Great Lakes Oil & Chemical Co. has begun construction of a \$350,000 addition to its Filer City, Mich., bromine plant. Production will include ethylene dibromide, methyl bromide and a variety of other organic and inorganic bromides.

• **Synthetic Rubber/Butadiene:** Copolymer Rubber & Chemical Corp. will soon start a 30% expansion of its Baton Rouge synthetic rubber and butadiene plants.

• **Resins:** Monsanto Canada, Ltd., will build a new synthetic resin plant at Clover Bar, near Edmonton, Alta.

• **Potash:** Industrialist Robert Campbell and associates will begin a \$25-million potash development in Saskatchewan. They have leased 300,000 acres in the Melville area.

• **Industrial Gases:** Liquid Carbonic Corp. will build two new chemical plants in the San Francisco Bay area. The first is a \$1-million electrolytic hydrogen unit; the second, a \$4-million liquid oxygen plant.

• **Petrochemicals:** Dow plans what it terms "a substantial investment" for a petrochemical plant on property it owns near the Bay Refining Corp. facilities at Saginaw, Mich. Plans hinge on negotiations for acquisition of the Bay Refining Corp.

• **Lithium:** Green Bay Mining and Exploration, Ltd., is planning to build a 1,000-tons/day lithium concentrator in Manitoba's Herb Lake area.

• **Sodium Borohydride:** Metal Hydrides Incorporated will build a \$5,250,000 sodium borohydride plant under terms of a contract with the U.S. government, which will bear the major cost of construction.

• **Ferromanganese:** Strategic Minerals Corp. will build a \$12-15-million ferromanganese recovery plant in New Brunswick, Canada.

FOREIGN

• **Melamine/Britain:** British Oxygen Chemicals Ltd. will double capacity of its melamine plant in Durham, to 10-12 million lbs./year. Cost: \$1.4 million.

• **Freon/Brasil:** Du Pont's Brazilian subsidiary, Du Pont do Brasil, will build a 3-million-lbs./year Freon gas factory near Rio de Janeiro. Expected to be operating by next year, the new plant, says Du Pont, should more than satisfy Brazilian requirements.

• **Antibiotics/Italy:** Chas. Pfizer will build a plant to make antibiotics and other pharmaceuticals 40 miles south-east of Rome. Construction is expected to start next month with full-scale production scheduled for the spring of '57.

• **Carbon Black/India:** Godfrey L. Cabot Inc. may partner New Delhi's Industrial Corp. in a \$5-million project to produce carbon black in India. The proposed plant would have a capacity of 10,000 tons/year, be in production by 1958.

...AMONG SOME 3500 ORGANICS

3620	p,p'-Benzylidenebis(N,N-dimethylaniline) MP 100-102°	5 g. ...\$2.20	10 g. ...\$3.90
	$[(CH_3)_2NC_6H_4]_2CHC_6H_5$... MW 330.45		

John D. MacPhail likes this better than the classic benzidine for the identification of bloodstains because he finds it more specific. Doing business as Forensic Science Service (144 Third Street, Fall River, Mass.), Mr. MacPhail knows how to keep legal evidence intact. He moistens a filter paper with 0.1N saline and merely presses it against an edge of an old stain suspected as blood. Then he touches the paper (not the stain) with one glass rod dipped in a 1:240 solution of Eastman 3620 in 40% acetic acid. A second time he touches it with another glass rod dipped in an 11:30 solution of sodium perborate in 40% acetic acid. If the paper turns blue-green after, but only after, the second touch, Mr. MacPhail knows the spot is **truly blood**. Per-

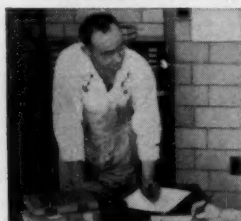
haps something in the bloodstain releases from the sodium perborate the oxygen to oxidize our compound to its far better known form, malachite green, a common dyestuff named for its color resemblance to the brilliant copper mineral malachite.

The first supply of our *leuco*-malachite green that Mr. MacPhail laid in worked fine down to the last grain; presto, twenty years of human violence had gone by and it was time to reorder. The second lot we supplied was green enough in the stock solution to invite sarcastic questions from lawyers. We suggested that Mr. MacPhail add a little sodium bisulfite to redress the redox balance *leucowards*. Now he reports he is all set again.

T 5289 2-(p-tert.-Amylphenoxy)-n-butyric Acid
5234 m-(p-tert.-Amylphenoxy)benzoic Acid
P 6368 p-tert.-Butylphenoxyacetic Acid
P 6192 a-(p-tert.-Butylphenoxy)propionic Acid
P 6815 (4-Chloro-2-methylphenoxy)acetic Acid
5229 o-Chlorophenoxyacetic Acid
P 5232 p-Chlorophenoxyacetic Acid
5514 2,4-Di-tert.-amylphenoxyacetic Acid

T 5449 2-(2,4-Di-tert.-amylphenoxy)-n-butyric Acid
5532 2,4-Dichlorophenoxyacetic Acid (& Practical)
6161 p-Ethoxyphenoxyacetic Acid
1415 Ethyl-γ-phenoxybutyrate
6234 p-Hydroxyphenoxyacetic Acid
5238 2-Naphthoxyacetic Acid
5658 p-Nitrophenoxyacetic Acid
3377 a-Phenoxyacetamide

1900 Phenoxyacetic Acid
5555 Phenoxyacetyl Chloride
1414 γ-Phenoxybutyronitrile
P 5378 a-Phenoxypropionic Acid
P 5381 a-Phenoxypropionyl Chloride
P 5504 (m-Phenylenedioxy)diacetic Acid
6883 m-Tolylphenoxyacetic Acid
P 6112 2,4,5-Trichlorophenoxyacetic Acid



◆ Here is the lad behind the above list of our aryloxy acids. When he and we decided to brave the storms together, he still had a year at his university to finish, including a course in literature chemistry. He asked us to suggest **a project for the course**. As a subject for bib-

liography, we suggested aryloxy acids. These had been investigated as plant growth regulators; ideas on exchange resins and plasticizers for cellulose acetate have also involved them.

He took us up on it. So, we have 1) the content of the currently available Vol. 28, No. 2 of our *Organic Chemical Bulletin*, as distilled from his survey under the cold eyes of referees; 2) the present occasion to tell the world that the above-named compounds may be obtained from us instead of the hard way.

6346	2,6,7-Trihydroxy-9-phenylisoxanthone	5 g. ...\$1.60	10 g. ...\$2.65
	$C_6H_5C:C_6H_2(O)(OH)OC_6H_2(OH)_2$... MW 320.29		
4400	N-(4,4'-Dimethoxybenzohydrilidene)benzylamine	1 g. ...\$1.05	5 g. ...\$3.15
	$(CH_3OC_6H_4)_2C:NCH_2C_6H_5$... MW 331.40		

No. 6346 is phenylfluoron, a reagent for germanium, aimed at the smokestack-prospecting trade. This trace element from coal has been made precious by the electronic industry's preoccupation with semi-conductors.

With No. 4400, known as Schoenberg's Reagent, as little as 40 micrograms of free sulfur can be detected in biological material, even in the presence of combined sulfur. There is practically nothing to it.

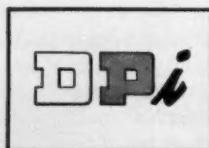
We can supply abstracts on both of these tests. No charge is made for the abstracts, nor for the postage to send them, nor for the cost of handling your request.

If you are favorably impressed by the abstracts, we may get your \$1.60 for five grams of 2,6,7-Trihydroxy-9-phenylisoxanthone or your \$1.05 for a gram of N-(4,4'-Dimethoxybenzohydrilidene)benzylamine. Perhaps the proceeds will enable our parent to better its 1955 gross of \$714,443,836.

Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y., can supply these and some 3500 other organics.

Prices quoted are subject to change without notice.

Erratum: In an advertisement appearing some months ago in this publication, it was indicated that the natural compound cantharidin (with which we were comparing one of the Eastman Organic Chemicals) possesses a double bond in the ring structure. It does not.



Eastman Organic Chemicals

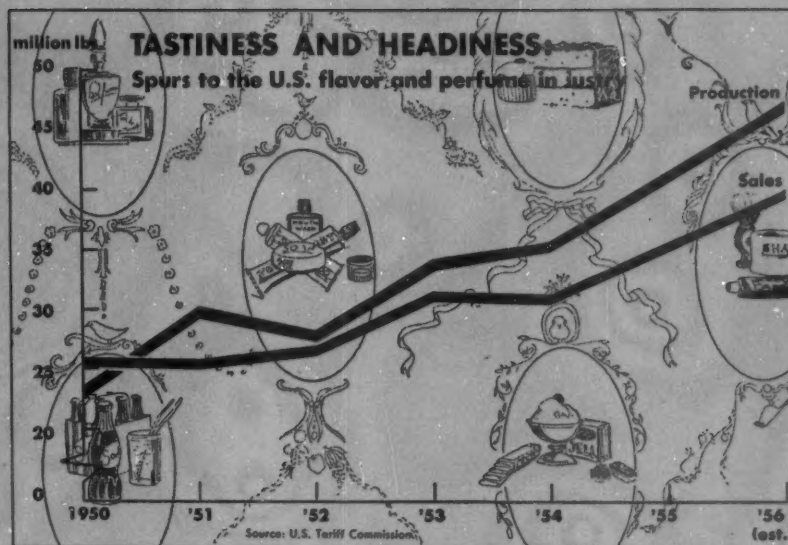
Also...vitamins A and E in bulk...distilled monoglycerides

Distillation Products Industries is a division of Eastman Kodak Company

Charting Business

CHEMICAL WEEK

June 23, 1956

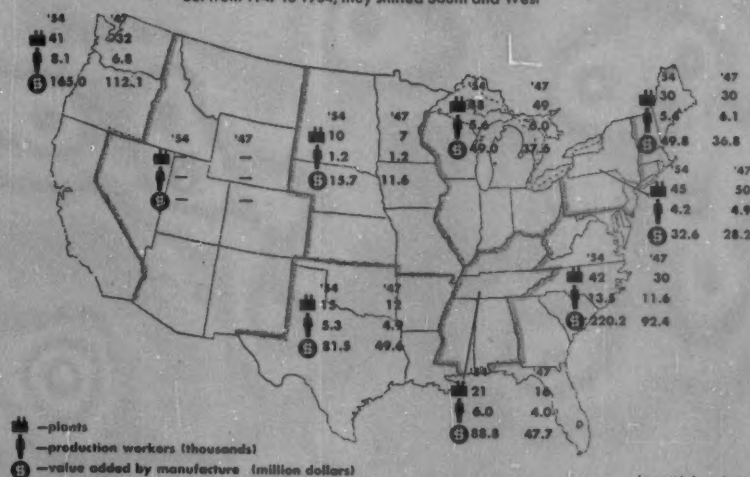


ALONGSIDE other fields in organic production, the U.S. synthetic flavor and perfume industry is small. The value of these organics to other industries, however, is almost inestimable. Reason: synthetic flavors and perfumes parlay their worth into billions of dollars as im-

portant components of myriad other products. In 1955, flavor and perfume materials reached a new sales high of \$51.2 million (up 8.4% from 1954). Of the total, monosodium glutamate accounted for \$20.8 million; methyl salicylate, \$1.6 million.

U.S. PULP MILLS PROSPER

But from 1947 to 1954, they shifted South and West

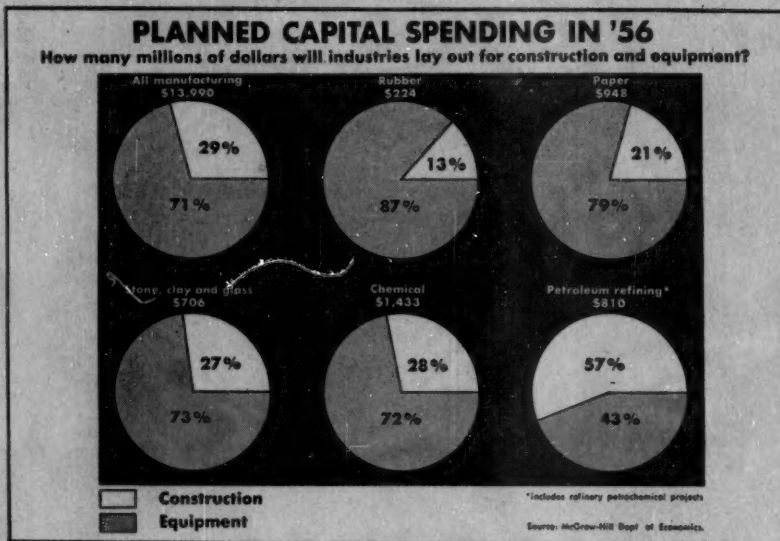


IN THE MIDST of an unprecedented paper production boom, pulp mills continue to flourish. These are the pulp mill figures in the latest government Census of Manufactures (1954 vs. 1947): value added by manufacture was up 64%; cost of raw materials rose

67%; value of shipments rose 68%; new capital expenditures during the period jumped 74%. Like many another processor, however, pulp makers are flocking to the South and West. These areas gained 32 plants, while the Northeast lost 9 plants.

Charting Business

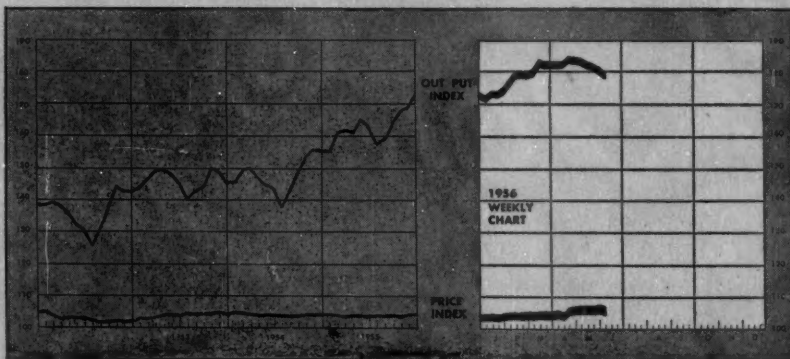
(Continued)



CAPITAL EXPENDITURES are up 48% for all manufacturing industries, up 41% for chemical industry, and up 30% for all business. Where will these expansion dollars go? It's difficult to differentiate between construction and equipment expenses (especially for chem-

ical and petroleum refining industries). But the figures shown above at least suggest the breakdown pattern for chemical processors. Outlook: from 1956 to 1959, chemical industry expects to increase its present capacity (pushing close to 100% in many plants) another 29%.

BUSINESS INDICATORS

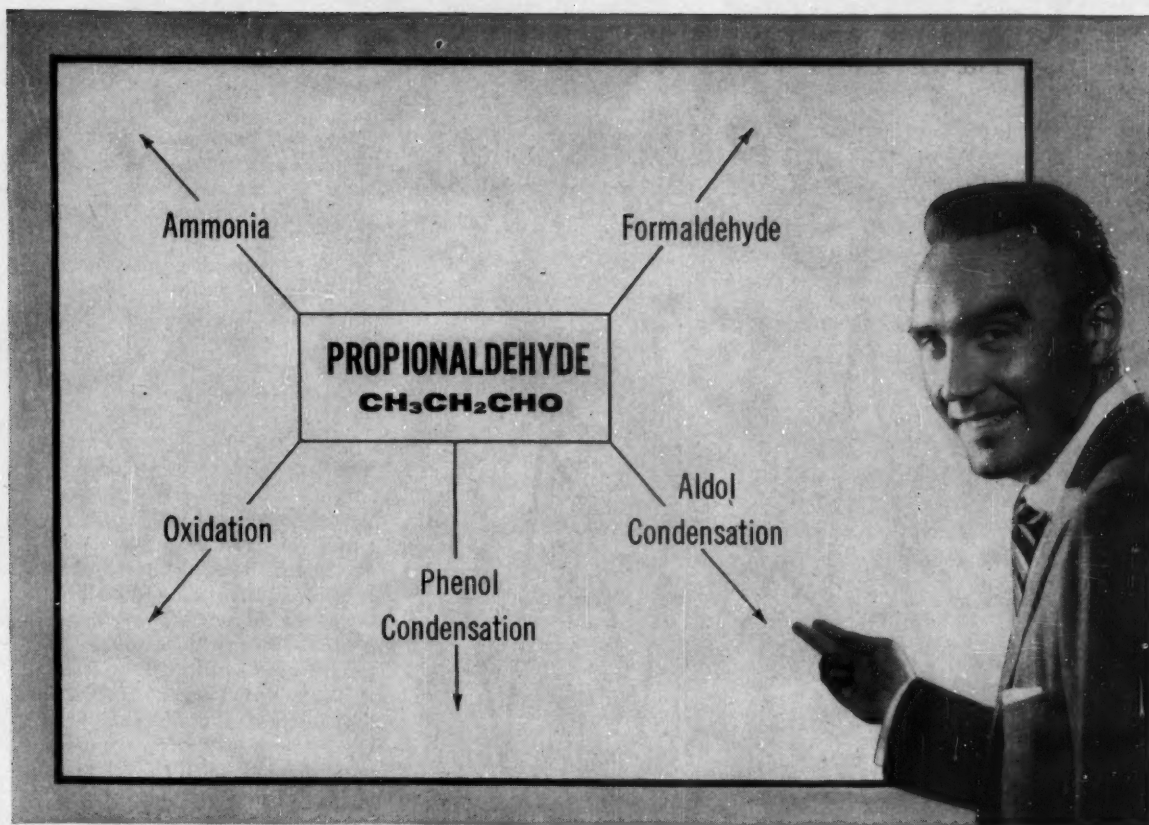


WEEKLY

	Latest Week	Preceding Week	Year Ago
Chemical Week Output Index (1947-49=100)	178.3	178.8	163.7
Chemical Week Wholesale Price Index (1947=100)	105.5	105.6	104.2
Stock Price Index of 11 Chemical Companies (Standard & Poor's Corp.)	467.5	464.1	440.3

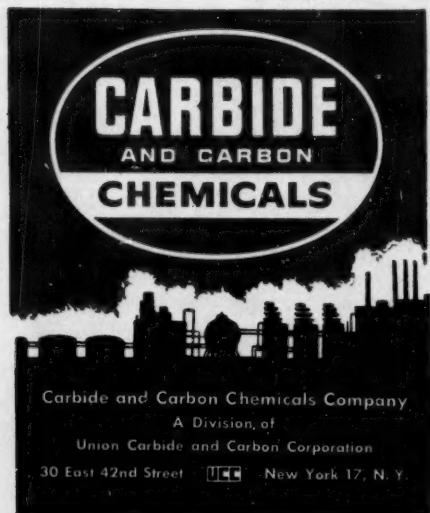
MONTHLY—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (other than Farm and Foods)	121.7	121.6	115.5
Chemicals and Allied Products	106.9	106.9	106.8
Industrial Chemicals	120.8	120.9	117.6



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(Now available in tank car quantities)



Propionaldehyde offers you a versatile and economical route to new and better products for industry. A product of CARBIDE's new oxo unit at Texas City, Texas, it is produced with consistently high quality.

These reaction products of propionaldehyde have already reached commercial importance—trimethylol ethane for alkyd and polyester resins; 2-methyl-1-pentanol for plasticizers; propionic acid for esters, salts, and cellulose ester molding powders; and propyl amines as rubber accelerators.

Other derivatives of propionaldehyde are intermediates for the manufacture of pharmaceuticals and lubricant additives.

Call or write now for a sample and complete information on propionaldehyde. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

ADMINISTRATION

CHEMICAL STRIKES: ZIGZAG PATTERN CONTINUES

(Work-time lost through labor disputes at U.S. chemicals and allied products plants)

Man-days lost

(thousands)

1,200 —

1,000 —

800 —

600 —

400 —

200 —

0

1941

'43

'45

'47

'49

'51

'53

'55

Source: U.S. Bureau of Labor Statistics.

Walkouts Wane in '56

Up in 1955, but back down this year. That's the outlook—as of mid-June—for work time lost on account of work stoppages in the chemical process industries.

It isn't as though the chemical labor unions are suddenly displaying the meekness of their nature. There have been several walkouts and near-walkouts at chemical and pharmaceutical plants thus far in '56, with one strike lasting over 30 days. But so far, there has been nothing like the few but intense disputes that marred operations at some plants last year (*CW*, Sept. 24, '55, p. 30).

The number of chemical labor agreements signed during the first half of this year is close to the first six months' total in '55; the big difference is that this year—with very few exceptions—the parties have found it much easier to come to terms. Among reasons:

- Last year, chemical managements sought to cling to the 5¢/hr. wage increase pattern that prevailed through the second half of '54, while the unions were striving to break that pattern.

This year, both sides are showing more flexibility in bargaining.

- Both big AFL-CIO chemical unions—the International Chemical Workers Union and the Oil, Chemical & Atomic Workers—have good reasons for wanting to avoid costly and disruptive strikes this year. For one

thing, they operated in the red last year and would like to build up their bank balances this year; secondly, both are busy forming “company councils” and “subindustry councils” for possible multiplant bargaining in the future and would like to usher in this innovation during a period of relative harmony; thirdly, the two unions are busy working out plans for organizing drives and for possible merger.

- The third big union in the chemical field—District 50 of the United Mine Workers—has a different but related reason for wanting to avoid strikes this year. Now that the other two unions are to get money and manpower from the AFL-CIO for organizing efforts (*CW*, June 16, p. 17), it's likely that attempts will be made to take over District 50 locals.

Bigger and Longer: Though lost time in chemical strikes in 1955 was up 298% over the previous year's unusually low total (*see chart*), the number of work stoppages was up by only 36%—from 77 to 105. Number of employees involved increased from 18,200 in '54 to 40,000 last year. (These figures exclude last year's phosphate strikes in Florida, which are grouped with nonmetallic mining.)

Contrasted with last year's strike activity, the chemical unions have been fairly docile up to now in '56. But what'll happen after the wage settlement in steel—especially in view of the moves toward multiplant bargaining and merger—is a big, broad question mark.

SEVEN UPS, TWO DOWNS

(Number of man-days lost in work stoppages in various segments of the industry, 1954 and '55)

Industry Group	1954	1955
Inorganic industrial chemicals	11,600	280,000
Organic industrial chemicals	69,600	172,000
Drugs and medicines	16,300	6,480
Soaps and glycerine	220	62,000
Paints, varnishes, etc.	23,000	26,700
Gum and wood chemicals	20,900	640
Fertilizers	5,910	69,600
Vegetable and animal oils and fats	3,200	6,560
Miscellaneous chemicals	8,950	9,940



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June 23, 1956 • Chemical Week

31

LEGAL

Antitrust, East and West: Two new government actions point up current vigilance on the antitrust laws.

- At Washington, the Federal Trade Commission has brought a complaint charging that Scott Paper Co. (Chester, Pa.) violated the anti-merger clause of the Clayton Act by its acquisition of Soundview Pulp Co. (Everett, Wash.), Detroit Sulphite Pulp & Paper Co. (Detroit), and Hollingsworth & Whitney Co. (Boston)—all since 1951. FTC says that Scott thereby increased its share of the sanitary paper market from 30% in 1950 to 38% in 1955, while its nearest competitor's share dropped from 11% to 10%.

- At Denver, U.S. Attorney Donald Kelley is planning to prosecute a criminal antitrust case against six rubber companies indicted last fortnight by a federal grand jury on charges of price-fixing in the sale of industrial rubber belts. Pleading is for June 29.

Bonding Agent Suit: In federal district court at New York, Carlisle Chemical Works is suing Maguire Industries and Nostrip, Inc., over a group of asphalt bonding agents. Carlisle wants declaratory judgment that its products and processes (a) do not infringe on defendants' Johnson patents and (b) that those patents are invalid. Carlisle also asks that Maguire and Nostrip be enjoined from filing any infringement action.

Industrial Development Agencies: Status of Florida's development credit corporations—set up by the state legislature to help new industry get started in the state and to help established companies expand—is in question. The Florida Securities Commission has asked the state attorney general to seek a court ruling on whether it's constitutional for such development corporations to be exempted from state taxes and from regulation under the state securities laws.

- **Exports to China:** Director John Borton of the Commerce Dept.'s Office of Export Supply has cracked down on a Vienna trading concern that allegedly bought 15 tons of paraffin wax from a U.S. supplier, then transshipped it from Hamburg, Germany, to Gdynia, Poland, for subsequent movement to Taku Bar, China.

IN COMMUNIST COUNTRIES, CHEMICAL INDUSTRY PLANS CALL FOR:

- **NEW CAPACITY**—Annual additions to capacity, including automation, to be increased by 84%. To account for 50-80% of increased production.
- **INCREASED EFFICIENCY** Through better utilization of capacity and personnel. To account for balance of increased production.

TO ACCOMPLISH THESE OBJECTIVES:

1. Increased crop yields through greater production and use of mineral fertilizers, chemical poisons and weed killers.
2. Increased production and utilization of oil gas, natural gas and oil products.
3. Expanded production of synthetic rubber and automobile tires.
4. Greater production and utilization of coke-oven gas and by-products of coking.
5. Increased production of synthetic tars, high-quality varnishes, electro-insulating materials and synthetic fibers.
6. Increased production of basic chemicals, especially sulfuric and nitric acids, ammonia and caustic soda.

Reds Seek Chemical Unity

Western chemical manufacturers can get set for further invasion of some export markets by the rapidly building Communist chemical industry (*CW*, March, 10, '56, p. 28). Latest Red maneuver to outstrip Western chemical production: bringing together of the satellite countries' chemical industries into one giant Soviet-headed cartel.

The objective of this maneuver—launched in conjunction with the Soviet Union's new Five-Year Plan—is to bring about closer coordination of chemical activities behind the Iron Curtain, and a more strategic division of manufacturing activities in that area.

Russia is setting a fast pace for her brood to follow by calling for tremendous increases in chemical industry output during the period 1956 to 1960. Throughout the Iron Curtain

area, the plan is to achieve increased production through expanded capacity and stepped-up efficiency (see table above).

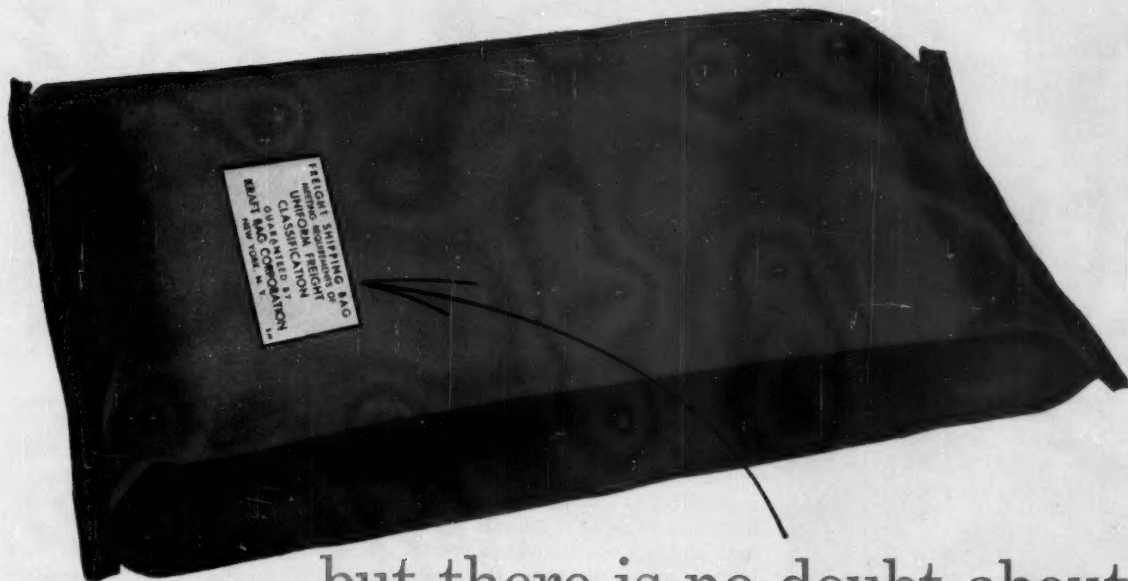
In the Soviet Union alone, chemical industry investments during the sixth Five-Year Plan will be 2.7 times those of the previous plan. Most of these investments will be earmarked for new capacity. According to the Communist-party organ *Pravda*, annual additions of new capacity to all chemical industries will be equal to 208,000 metric tons of new production—an 84% increase over capacity additions in 1955.

Automation for Basics: Along with proposed boosts in Red chemical capacity will come increased emphasis on automation. Five-Year-Plan directives call for the beginning of "the complex automation of shops and plants; first and foremost of plants

Cigars and Multiwall Bags



Kraft Bag Corporation, as a manufacturer of multiwall bags, is in the same position as the cigar manufacturer who complained that everything to be said about his 25c cigars had already been said about 5-centers!



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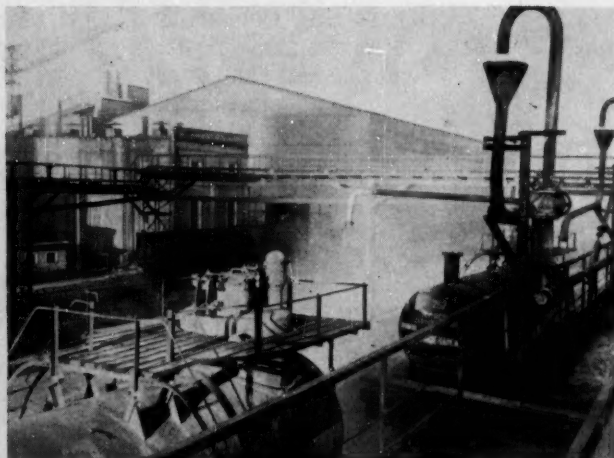
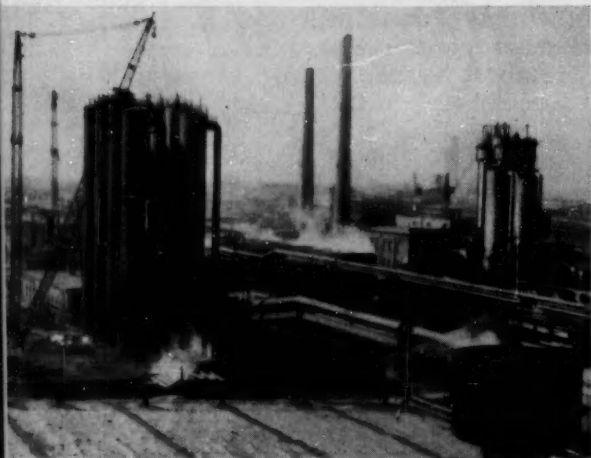
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ADMINISTRATION

● KEY TO REDS' NEW CHEMICAL PLANS

Closer coordination among the chemical industries of the U.S.S.R, China and satellites. Object: strategic division of manufacturing activities.



IN RED'S CHEMICAL COMPLEX: Benzene-from-coke unit in Poland (left), and a new Estonian fertilizer plant.



CITRIC FROM MOLASSES: A Czech plant claims new process.

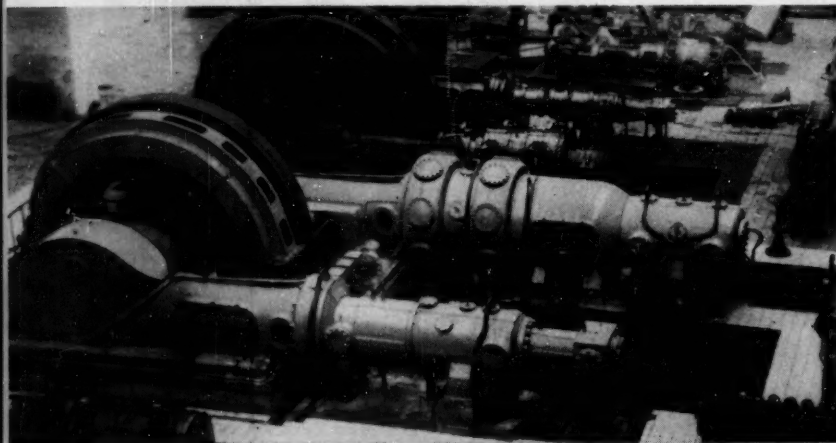
producing sulfuric and nitric acids and soda ash—[and] to construct and put into operation an automatized shop producing sulfuric acid." The Communists expect this automation to yield a 91% increase in production of sulfuric acid by 1960. The 1955 output of sulfuric acid in the Soviet Union was an estimated 3.6 million metric tons.

Production of synthetic rubber will also receive special attention during the next five years. It appears that the 1955 Soviet goal of 470,000 metric tons was not reached. A directive of the new Five-Year Plan calls for a

better than twofold jump in synthetic rubber production by 1960.

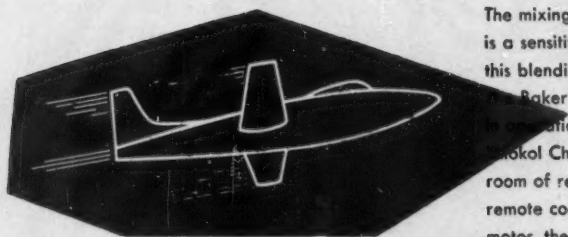
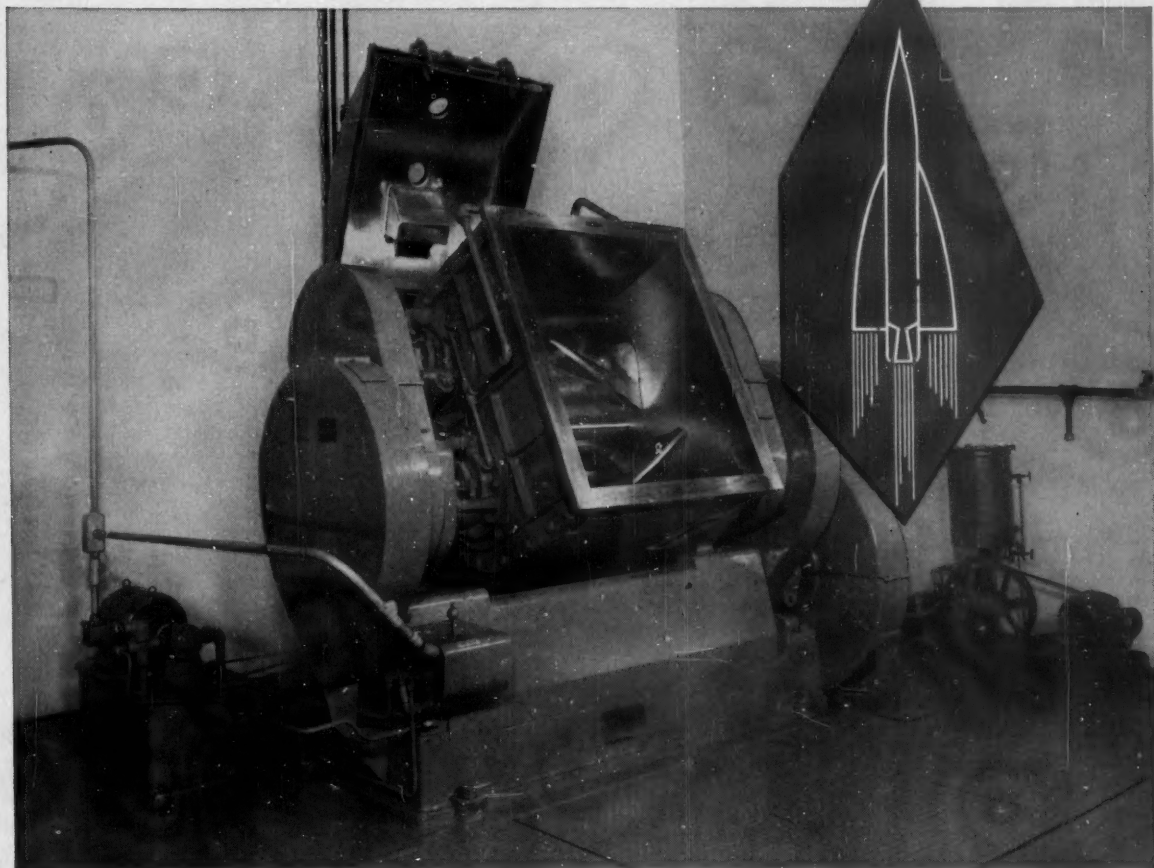
Obstacles to Hurdle: The Soviet Union's ambitious undertaking to fashion the chemical industries within the Communist bloc into a giant chemical complex will have numerous obstacles to overcome. There is relatively little information available on the exact size or strength of the satellite chemical industries, but it is generally agreed that those of Poland and Czechoslovakia are the strongest. Both of these countries are reportedly making extensive chemical shipments to Red China. On the other hand, Communist China has been claiming self-sufficiency in acids, alkalis and dye-stuffs for the near future, but it appears that—at least through that country's current Five-Year Plan—sizeable quantities of chemicals must be imported. Manchurian chemical production, even if expanded, probably can't meet local needs.

Soviet Premier Bulganin, speaking before the recent Twentieth Congress of the Communist Party of the Soviet Union, stated that "the present state of our chemical industry cannot satisfy us, and it is therefore proposed to accelerate its development in the sixth five-year period." The call has gone out to Red countries throughout the Iron-curtain area: build up the Communist chemical industry.



COMPRESSED NITROGEN: Red China unveils a new 2,400-hp. compressor.

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The mixing of rocket propellant from new high-energy fuel materials is a sensitive, highly demanding operation. The mixers which do this blending must therefore be not only efficient, but dependable. The Baker Perkins No. 15 Mixer shown here is but one of many in operation in the rocket propellant field. This unit at the Thiokol Chemical Corporation is enclosed in an explosion-proof room of reinforced concrete, and is engineered for complete remote control operation. Powered by a 50 H.P. silent chain drive motor, the No. 15 Mixer is constructed of Stainless Steel, and jacketed to carry 125 psi pressure of steam or water. Its Sigma blades revolve on anti-friction bearings, hydraulic tilt is provided for the mixing chamber, and the vacuum cover is pedestal mounted. Working capacity of this mixer is 100 gallons, and total capacity 150 gallons. If you have a process that calls for a high-performance mixer, write Baker Perkins for complete catalog.

333

PROSPECTIVE PERSONNEL ACCOUNT**Producers of Industrial Chemicals
1965**

**Estimated number of engineers
and scientists needed by 1965 . 160,000**

On hand in 1954 54,000

**Minus anticipated losses by death,
retirement, etc., 1954 to '65 . . . 20,000**

Net carried over from 1954 34,000

**New graduates expected to be
hired, 1954 to '65 42,000**

**Total estimated employment of
engineers and scientists, 1965 . 76,000**

Anticipated deficit 84,000

Human Deficit Sighted: 50%

Starkly confronting the chemical industry in the U.S.: the likelihood that its producing companies by 1965 may be staffed with only about 50% of the scientists and engineers needed for "average industry growth."

This is the finding of a Manufacturing Chemists Assn. committee that has conducted an independent study of the technical manpower situation in this country. Other conclusions: in industrial chemicals, the shortage may be as much as 84,000 out of a needed 160,000 (*see table, above*); throughout all manufacturing industries, the deficit may be 457,000 out of an estimated need for 1.7 million.

Based on that survey—which took into consideration the anticipated requirements of the large individual chemical companies whose representatives served on the study group—the committee is recommending a "substantial expansion" in MCA's education program (*CW, Feb. 4, p. 26*). This proposal was endorsed in principle by MCA's executive board during last fortnight's annual meeting at White Sulphur Springs, W. Va., and member companies are now being polled on the new plan.

Accent on Youth: Youngsters—particularly those in junior high schools, such as the eighth-graders (*see cut*) in the special advanced science class at Central Junior High School, Homewood, Ill.—are the key to the problem, says Du Pont's Glen Perry, vice-chairman of the committee. "If the needs of the country and of the chemical industry are to be met," he declares, "we must imme-

diately begin to double the number of junior high school students preparing to become scientists and engineers—and time may very well prove that we are underestimating our needs."

Raymond Ewell, consultant to the committee, calculates that only 82,000—about 3.3%—of the 2.5 million students now in grades 7, 8 and 9 are likely to become scientists or engineers. That number, he figures, is only half of the nation's yearly need.

Accordingly, the committee has drafted a program that calls for active cooperation with schools at every level from sixth grade through college. Perry told MCA leaders that results of a pilot program conducted this year at junior high schools in 50 communities throughout the country have been "encouraging enough to convince us that we're on the right track." This segment of the program—which includes materials for students and for teachers—will be extended to senior high schools in the school year starting in September.

At next month's meeting, MCA directors are expected to decide how to carry out the initial five-year program to interest young men and women in scientific careers. Meanwhile, industry executives are mulling over the committee's warning that potential shortages of technical manpower are "a genuine threat" to growth and expansion, and that unless more young people take up careers in science and technology, it's possible that industrial expansion will "slow down to a walk, a crawl, or a stop."



ILLINOIS JUNIORS: On such as these, MCA is pinning hopes for 1965.

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Natural Rubber Latex	3%	175 cps	3750 cps
GRS X 446	3%	125 cps	7600 cps
Nitrile Rubber Latex	3%	75 cps	6000 cps
Acrylic Emulsion	3%	50 cps	1425 cps
Polyvinyl Acetate	3%	1100 cps	4550 cps

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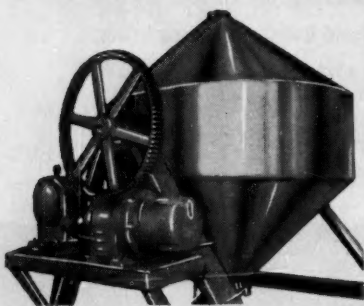
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OW 6-23

ADMINISTRATION

LABOR

Layoff Pay Polemics: Accelerated by three propellants—the need for making decisions on legality and handling of supplemental unemployment benefits, current layoffs in auto and other industries, and election-year politics—debates over unemployment compensation are buzzing along fast and furiously this week in various states that rank high in chemical industry concentration.

In Michigan, Governor G. Mennen Williams has called a special session of the legislature to take up his recommendation that state aid to unemployed persons be pegged to prevailing wage rates. Declaring that benefits under the present law were designed to approximate two-thirds of weekly earnings but now average only about one-third, Williams is asking the legislature to set state payments at 65% of the individual's pre-layoff earnings, but not more than two-thirds of average weekly earnings in the state.

Missouri employers—through their state chamber of commerce—are contemplating court action to stop the state's Division of Employment Security from paying state benefits to anyone receiving SUB benefits from private funds. In Ohio, the administrator of the Bureau of Unemployment Compensation holds that state and private layoff pay plans cannot be integrated under present law, but

urges that the legislature consider making the law more specific on this point, one way or the other.

And in Massachusetts, the House of Representatives has passed a bill that would make strikers eligible to receive unemployment compensation.

Raid Attempt Fails: For a while, it appeared that the International Chemical Workers Union (AFL-CIO) might be able to edge out the assertedly left-wing United Electrical Workers (Ind.) at a North American Cyanamid plant in Ontario. But UE staved off the election for another year by negotiating a new 12-month contract with wage increases ranging up to 11¢/hour. ICWU says it withdrew its application for an election "to avoid any suggestion that it is interfering in any way with the contractual benefits the employees have received."

KEY CHANGES

George Barnes, to chairman, and **Earl R. Dodd**, to president, O-Cedar Division, American - Marietta Co. (Chicago).

Peter P. Bouroff, to manager, chemical division, E. F. Drew & Co. (New York).

Howard O. McMahon, to vice-president, Arthur D. Little, Inc. (Cambridge, Mass.).

Wilson K. Minor, to comptroller, Standard Oil Co. of California (San Francisco).

H. H. Burrows, to senior vice-president, Rubber Sales Division; and **R. B. Hazard**, to vice-president and sales manager, Rubber and Packing; Raybestos-Manhattan (Passaic, N.J.).

Arthur H. Buhl, Jr., to director, Parke, Davis & Co. (Detroit).

Jared J. Mowry, to vice-president, Polymer Southern (Greenville, S.C.).

Robert D. Norton, to New York sales manager, Dean Brothers Pumps, Inc. (Indianapolis).

KUDOS

To **Sidney M. Cadwell**, director of research and development, U.S. Rubber Co. (New York), the 1956 Charles Goodyear Medal of the American Chemical Society's Division of Rubber Chemistry.

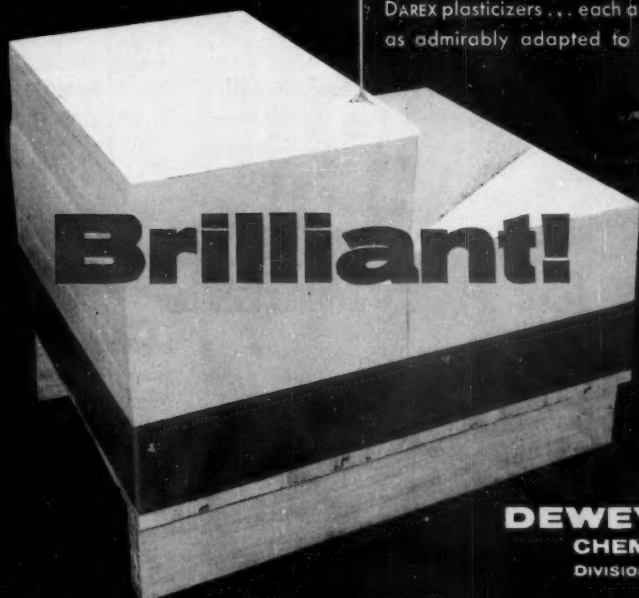


GOVERNOR WILLIAMS: For pegging layoff pay to prevailing wages.



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RESEARCH

A year ago, cyanoethylation's future seemed to be tied almost wholly to . . .

	What It Does	Applications	Current Status
● Cotton	Imparts permanent resistance to rot, mildew, bacteria Improves abrasion, stretch resistance Increases receptiveness to all dyes, including acid colors	Tarpaulins, filter fabrics, awnings, fish nets, laundry roll covers, tobacco shade cloths, thread, etc.	Treated fabrics and fibers undergoing field tests.

Today, cyanoethylation is also under investigation in these fields . . .

	What It Does	Applications	Status
● Paper	Improves moisture resistance, dimensional stability Increases dielectric constant	Punch cards for automatic business machines Electrical insulating paper	Laboratory evaluation Laboratory evaluation
● Jute	Imparts water resistance, improves abrasion resistance.	Protective covering for underwater telephone cables Rope	Undergoing field tests.
● Chemicals	Yields new products via the reaction of active-hydrogen compounds with acrylonitrile	Too early to tell	Sample quantities available for investigation.

New Angles for Acrylonitrile

While there's no cause for celebration, early field performance of cyanoethylated (acrylonitrile-treated) cotton textiles is offering some encouragement to the joint sponsors—Institute of Textile Technology, American Cyanamid and Monsanto—of the project devoted to developing these products. (CW, Aug. 21, '54, p. 97).

ITT's technical director, Jack Compton, reports that cyanoethylated textile products are showing up well in fishing-net lines and sewing thread. Tarpaulins

and tents also are being tested, but results here won't be coming in for some time.

Compton estimates that 30-40% of field-test results are in. About 80% of the work will have to be completed before a decision to press forward or discontinue the cyanoethylation program can be made. That, Compton thinks, will take another 6-12 months.

Wrapping Up: But development of the cyanoethylation process is about wrapped up. Cyanamid, Monsanto,

and ITT are preparing a joint summary report that should be out by August 1. To deal only with the process, the report will make no attempt to present data obtained in evaluation of treated products.

Cost will be the report's chief eye opener. Cost of a commercial cyanoethylation unit to produce 50 yds./min., or 10 million pounds of treated cotton/year, is expected to be pegged at \$300,000. That would mean a cost of 13-16¢ to cyanoethylate 1 pound of

cotton (now selling for about 35¢/lb.). This figure includes all costs—depreciation, raw materials, labor, etc.—but it still is stiff.

The reaction of textile men to this tab will be influenced, of course, by how the treated material compares to synthetics in price and performance. Nevertheless, even the largest textile mills may balk at the outlay required.

And they won't be too happy about the prospect of using toxic, flammable acrylonitrile. This, however, should not be a problem if proper handling procedures are used.

Encouragement, however, is provided by a new, one-step method (vs. two steps previously required) that is said to minimize mechanical losses of acrylonitrile during processing. Savings are estimated at about 2¢ per pound of cotton, dropping the over-all cost of treatment close to the 13¢/lb. mark.

Mill Job: Fabric for field evaluation—some 20,000 yards of it—was produced by the mill members of ITT from cyanoethylated cotton provided by Cyanamid and Monsanto. The mills put the fabric out for testing, collect trial results and send them to ITT, which compiles and analyzes the data.

The cyanoethylated cotton itself was produced at two semiworks units that were built and are run by the two member chemical firms. Cyanamid supplied and installed the equipment at Rossville, Ga., in facilities provided by a member of the Institute, Standard-Coosa-Thatcher Co. Monsanto operates a unit at Texas City, Tex., in cooperation with another Institute member, Fultan Bag and Cotton Mills (Atlanta, Ga.).

Both companies aver that they have no intention of cyanoethylating cotton commercially. Their object has been to get the process off to a good start. In the long run, they hope the effort will pay off in increased acrylonitrile sales, of course.

Right now, it's still too early to tell if this aim will be realized. Monsanto's Virgil Waggoner, acrylonitrile development representative, and Harry Walker, research-development manager, both declare that cost alone will not tell the story—cost vs. performance, they maintain, will decide cyanoethylated cotton's future in the textile market. And until the field evaluation program is completed, performance

will remain a relatively unknown quantity.

Good on Paper: While cotton represents the biggest potential for cyanoethylation, applications are also turning up in other fields (see table).

International Business Machines, for one, is evaluating cyanoethylated paper. Laboratory investigations during the past 3-4 months show that the treatment improves water resistance and dimensional stability. This is important in punch cards, which must keep their shape, so that they can be handled by the feed mechanism of automatic business machines.

IBM prepares the final product from cyanoethylated pulp. Cyanamid supplies technical assistance. Here, too, it's too early to make predictions, but the firm does say the process looks encouraging.

General Electric finds that cyanoethylation improves the dielectric constant of paper; treated papers are possible insulators in small capacitors. GE holds a patent (U. S. 2,535,690) on the preparation of fibrous dielectric compositions produced by reaction of lignocellulose pulp and acrylonitrile.

GE reports that although the treatment improves the dielectric properties, economics are against it. Says a GE spokesman, "We know what the treatment will do, but it's too expensive right now. We'll look at it again

when the price of acrylonitrile goes down some."

Watery Prospect: Bell Laboratories (subsidiary of American Telephone and Telegraph) is field-evaluating cyanoethylated jute. The product has good water resistance, may be used as a covering for underwater cables.

And both Monsanto and Cyanamid have chemical products prepared by the cyanoethylation reaction in various stages of development. Some are now out for evaluation. Monsanto, for example, is offering sample quantities of succinonitrile, β -chloropropionitrile, β -chloropropionic acid. Cyanamid offers similar compounds as does Carbide & Carbon Chemicals Co. (division of Union Carbide and Carbon Corp.).

More such chemicals can be expected, since any organic compound which has a reactive hydrogen will undergo the cyanoethylation reaction with acrylonitrile.

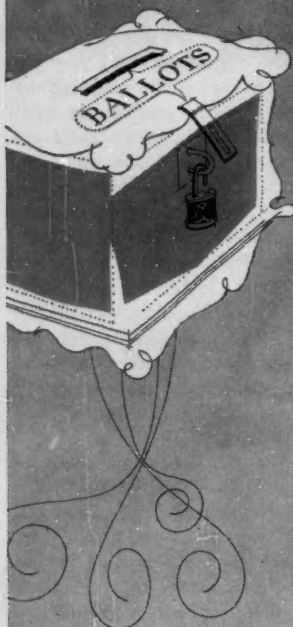
Long Way to Go: From the preliminary results of field trials, it's apparent that cyanoethylated cotton has a long way to go before it will start cutting into ground belonging to the synthetics. But in the long run, it's a good bet that cyanoethylated products in some form will reach commercialization.

With all the research interest behind it, cyanoethylation can't help but move forward.



WAGGONER AND WALKER: Cost vs. performance should be the test.

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RESEARCH

EXPANSION

- Koppers Company (Pittsburgh, Pa.) plans to build its new multi-million dollar research center on a 176-acre tract of land near Monroeville, Pa.

- A center for research on feed additives and drugs for poultry, farm animals and household pets will be established by Abbott Laboratories (North Chicago, Ill.) at a 207-acre site near its North Chicago plant.

- Logo, Inc. (Chicago) recently completed adding 7,000 sq. ft. of plant, office and research laboratory space, tripling its capacity for research

in conventional and vacuum-metalized coatings.

- Now in operation is Olin Mathieson Chemical Corp.'s Morgantown, W. Va., new experimental unit for producing synthesis gas by partial oxidation of coal.

- Portland Cement Assn. will spend \$1.8 million to add two new laboratory buildings to its research and development facilities at Skokie, Ill.

- Ninol Laboratories has transferred its research and development laboratories to the firm's new plant on Chicago's south side. Business and executive offices have moved to larger quarters in the Loop.



Getting to Know the Enemy

On the premise that too little is known about the myriads of insect species—harmful, beneficial, or supposedly neutral—Dow Chemical and the University of Michigan are jointly sponsoring a new basic research project in insect taxonomy.

Dow disclaims any immediate connection between the project and its own insecticide research.

Key figures in the work will be Dow consultant Robert Dreisbach (left) and project director Henry Townes, research associate at the university.

"While any kind of research on insects would benefit from more effort," Townes says, "it is gener-

ally understood that insect taxonomy (classification according to an organized system) particularly is a field in which more rapid progress should be made."

The project is specifically aimed at preparation of taxonomic monographs on U.S. parasitic wasps.

Dr. Townes says that to make the best progress possible, cooperation with research workers in other institutions will be freely sought and freely given.

Dow is providing the funds while the university supplies laboratory space and general facilities in its Museum of Zoology on the Ann Arbor campus.

Shipping chemicals



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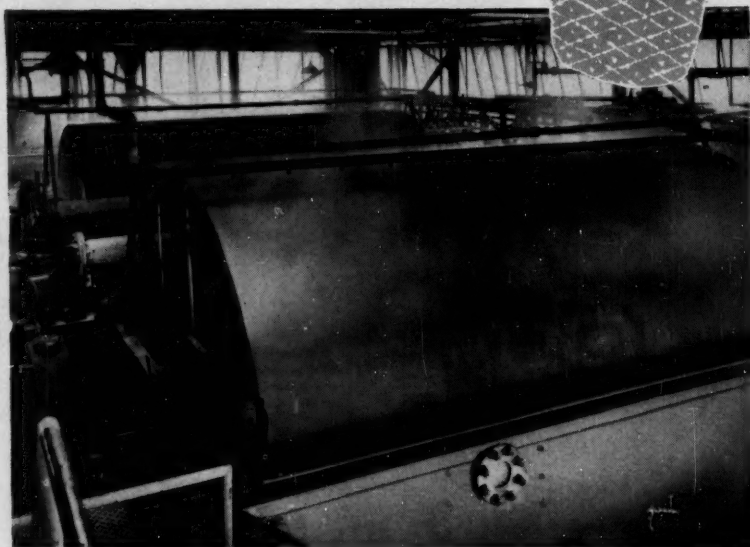
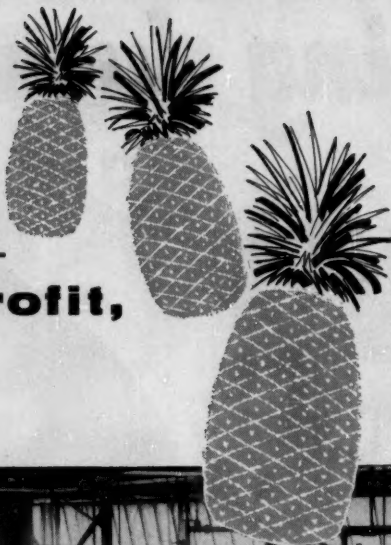
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RESEARCH



ARF'S "BOILER": On the south side, fission plus safety.

Triple Protection

Armour Research Foundation (Chicago) unveiled its industrial research nuclear reactor this week, pointing with pride to safety features that helped the project elicit Atomic Energy Commission approval.

Safety is of unusual concern here, since the project is located in a (still uncompleted) building adjacent to the foundation's other research facilities on Chicago's populous near south side.

The reactor, a "water boiler" type, is designed to contain its toxic products. Fuel—uranyl sulfate (about 88% enriched in uranium-235) dissolved in water—is contained in a 1-foot stainless steel sphere (*see cut*). Hydrogen and oxygen, evolved through radiolysis of the water, circulate and are recombined in a completely closed stainless steel plumbing system.

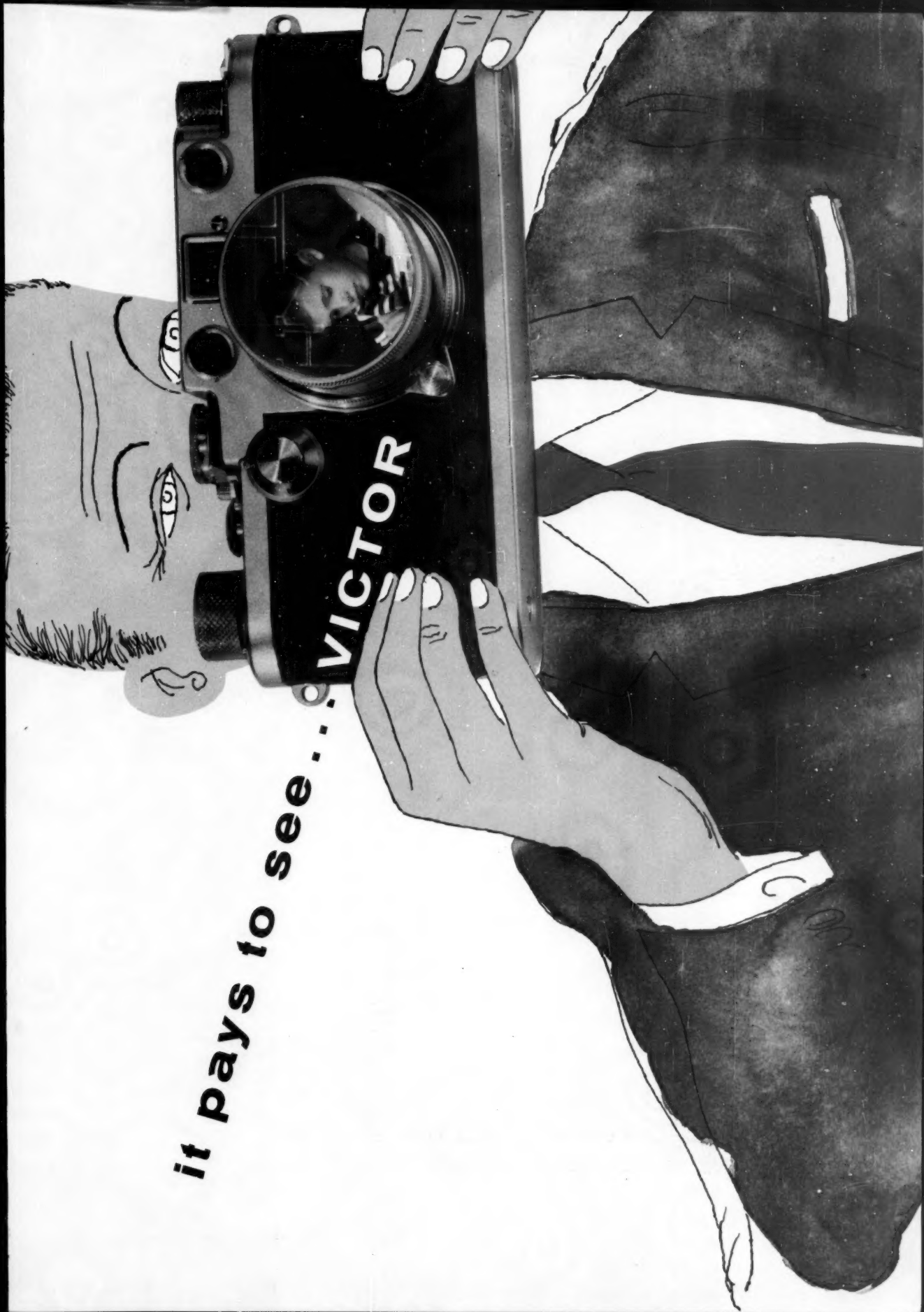
A metallic envelope totally surrounds the reactor core and the plumbing system. And a third enclosure is the reactor room itself, which is airtight. These three barriers are independent of each other, would have to be breached simultaneously to release any appreciable amounts of radioactivity into the atmosphere.

Explosion is considered impossible. If the reaction picks up too much speed, the fuel solution boils and the reactor shuts itself off.

The reactor was built by Atomics International, a division of North American Aviation, Inc. (Canoga Park, Calif.).

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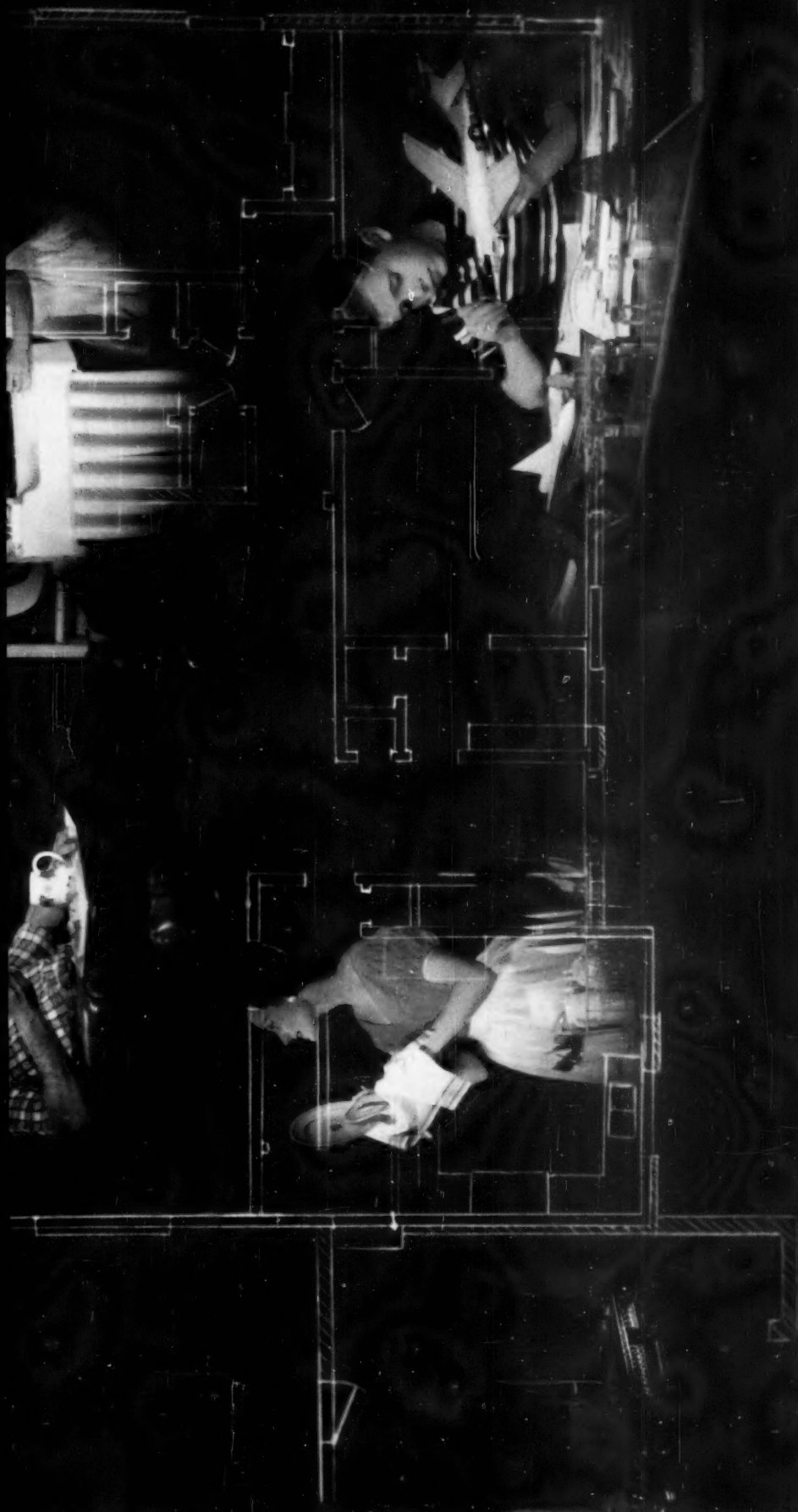
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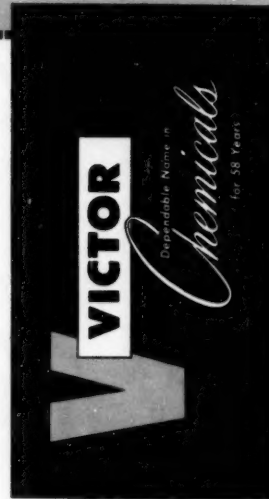
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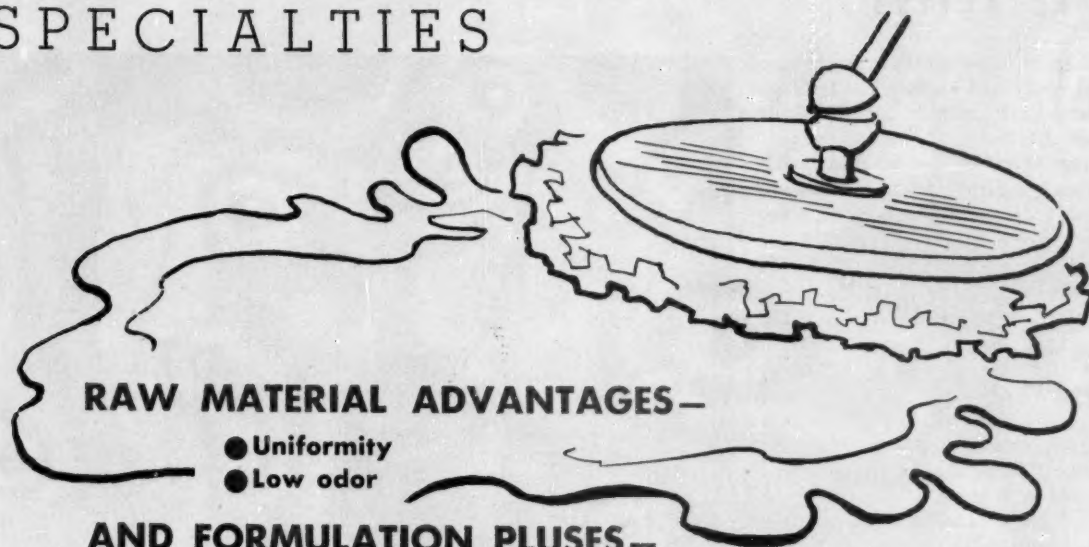
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Polyethylene Bids for Polish Role

With some 25 manufacturers already incorporating polyethylene resins in their polishes, and more firms readying similar products—e.g., T. F. Washburn Co. (see p. 50)—it's plain that these synthetic "waxes" have arrived.

The fact is underlined by the entrance about a year ago, of a second supplier—Eastman—of these polish polyethylenes.

Semet-Solvay (division of Allied Chemical and Dye) led the way about two years ago with its low-molecular-weight resins. Now Eastman Chemical Products is offering a line of polyethylene waxes designed for the same kind of duty. (Other suppliers of polyethylene—Bakelite, Celanese, Grace, Du Pont, Koppers, Monsanto, Phillips, Spencer—as yet have made no overt move to introduce wax products.)

Partnership Role: Although polish formulations—both paste and emulsion types—made exclusively with the polyethylene resins are probably possible, the new resins have been promoted so far as products to be used in combination with other wax materials. They're compatible with a host of other polish ingredients, and as Semet-Solvay pointed out to specialties makers at the Chemical Specialties Manufacturers meeting last month,

they have some other attributes, too.

Light-colored, odorless resins of uniform quality and price (Allied's, 40¢/lb., Eastman's, 47-50¢/lb.), they are touted to the industry as imparting:

- Durability
- Gloss—with nonslip properties
- Emulsion stability
- Toughness without brittleness.

Further, Semet-Solvay says, the new materials don't require new polish-making techniques. The company claims that a formulator experienced with the common wax-to-water procedures for emulsion making can expect to have no trouble with the polyethylenes. Nothing special in the way of equipment, no unusual operating temperatures, no revisions of production facilities are claimed to be needed when these new resins are used.

Paste or Emulsion: They're being plugged hard for emulsion waxes right now (Semet-Solvay backing its #629 for emulsion use, Eastman its Epolene E) but the polyethylenes got into the polish business via solvent pastes.

Semet-Solvay's #6 was the pioneer product for this purpose — a non-emulsifiable material first turned out commercially in Allied's 20-million-lb. Buffalo (N.Y.) plant about two years ago. Solvay's manufacturing process—its own, incidentally, not licensed—re-

sults in both the high and the low-molecular weight material. Eastman, on the other hand, has a manufacturing license from ICI; its polish Epolene E are in the 4,000-6,000 molecular-weight range, thought to be a bit higher than that of the A-C resins.

Typical paste formulations (for furniture and shoe polishes) call for the polyethylene to be about half the solids content of the polish. In this proportion, it is claimed to boost scuff resistance and, most important, provide a fast "setup" of the polish (i.e., it solidifies speedily in the container). Semet-Solvay's #6 can be used with vegetable waxes whose "oil holding" qualities are better than those of polyethylene. And #6 makes the polish look properly shiny in the can—an important sales feature.* Eastman's comparable product is Epolene N.

But emulsion polish manufacturers have been the prime targets since Allied's Central Research labs showed them how to use p.e. With formulations calling for 15-20% of the solids content to be polyethylene, there is a hefty market for the resins in this industry. An estimated 30-40 million

*This ability to impart a gleaming finish to other materials turns up additional uses for the low-molecular-weight polyethylenes. They add shine to such articles as dishpans, egg holders, kitchen utensils molded of high-molecular-weight poly.

SPECIALTIES

gallons of household floor finishes are sold yearly, and another 10-12 million gallons are tabbed for industrial maintenance.

Big Five: In the emulsion-polish industry, a large part of the business goes to about five firms—S. C. Johnson (Glo Coat, Hard Coat, Stride floor finishes), Boyle-Midway, division of American Home Products (Aerowax and Old English), Simonize Co. (Simonize waxes), Beacon Chemical Co. (Quik-Gloss) and E. L. Bruce (Bruce Floor Wax). So far, none of these firms admits to incorporating the polyethylenes in standard formulations, although they all have experimented with them, or are doing so now. Trade sources indicate that Simonize may be the first of the Big Five to come out with a poly-polish.

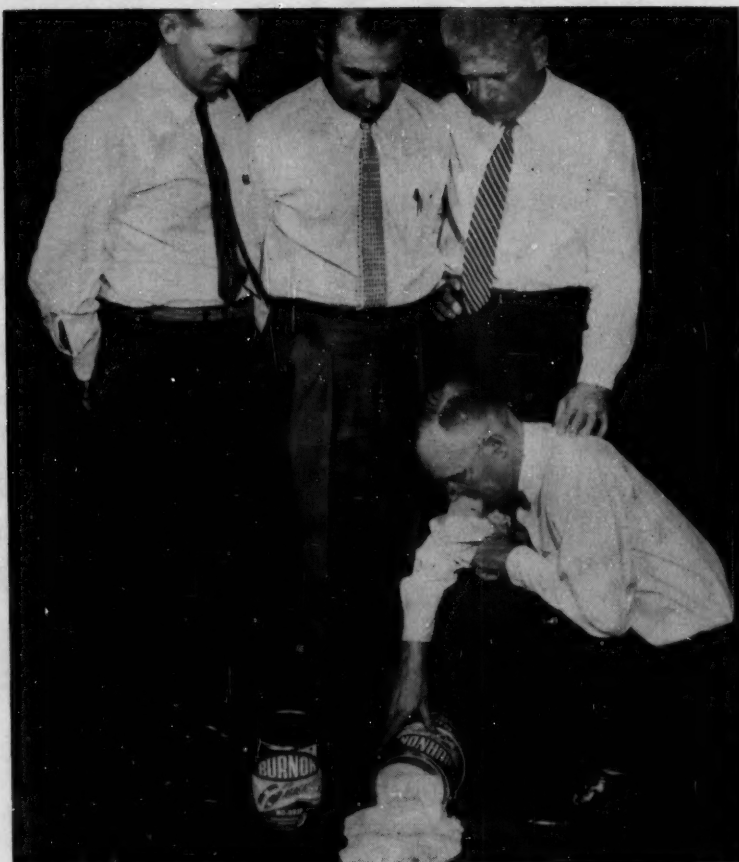
A number of other polish makers, however, have been quick to take a shine to polyethylene. Most widely known formulation built around the synthetic ingredient now is Floor Show, made by R. M. Hollingshead (*CW*, June 9, p. 58).

Across the nation, such formulators as Uncle Sam Chemical Co. (New York), T. F. Washburn (Chicago), John C. Stalfort & Sons (Baltimore), Woodbury Chemical Co. (St. Joseph, Mo.) are using it.

Formulators of shellac-containing polishes find that polyethylene reduces water spotting, makes the film more readily removable, less likely to build up into a yellowing deposit. Formulators of carnauba-based polishes also welcome the new material, since it combines well with more-expensive carnauba to produce a polish with top quality features.

But few firms seem to want to stress the synthetic aspects of their polishes—Hollingshead is the notable exception. Many avoid reference, at least in their messages to the public, to their novel materials. As a promotional peg, the polyethylenes plainly have not been fully exploited.

The polish industry, moreover, has long been shy about using synthetics in their products—or at least hesitant about advertising the fact. Though a number of man-made materials (polystyrenes, petroleum waxes) have found uses in polishes, most formulators prefer to stress the natural-wax content of their products. Perhaps the polyethylenes can bring acceptance and advertising of synthetic materials.



WASHBURN'S EXECS*: Finding a bonanza in a paint alkyd, they take a . . .

Firm Stand on Jels

Hark back to the talk at T. F. Washburn Co. (Chicago) half a dozen years ago, and you'll find some hopeful predictions of the firm's future: you'll hear President Linus (Linie) Smith betting that one of his research lab's developments—thixotropic or jelled alkyds for paints—has giant growth potential.

Then, take a look at Washburn's current sales picture, and you'll see that things have turned out even rosier than had been hoped. Current production schedules call for about 5.5 million lbs. of the jel-alkyds this year** (4.7 million last year), against 1949's production of about 180,000 lbs. Paint

division sales—currently about 45% of the firm's business—have likewise vaulted in the same period, now hover around \$1.5 million/year (about double '49's sale).

And the alkyds haven't stopped drawing in customers. Sears, Roebuck and Co. will soon add a jel paint based on Washburn vehicles to its line. Montgomery Ward already has such a paint—as do some 120 other paint makers, who either buy Washburn's material (Washburn makes no finished paint itself), license its manufacture, or purchase from other licensees, both in this country and abroad.†

To spark sales, the firm is adding a new product, Burnok #3929—pure drying-oil alkyd, designed for high-gloss enamels and "blisterproof" house-paints.

†Some other major paint companies using the jel-alkyds—American-Marietta, Superior Paint & Varnish, Archer-Daniels-Midland, Frederick Stresen-Reuter.

*Kneeling: Bill Winkler (factory supt.); standing, l-r: George Tinker (gen. mgr.), Nick Contos (asst. gen. mgr.), Linus Smith (pres.).

**In 1949, the paint grinding division produced a total of some 4.2 million lbs. of vehicles—but only 4.3% was jel-alkyds. In 1953's 7.5 million lb. total production, the jel types made up 63%. The firm says frankly that the new material has kept it a strong factor in the paint field, and that its business in that area would be about a third of what it is now if it hadn't been for jel-alkyds.



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Olefins are used in production of quality resins for heavy-duty varnishes. They offer faster drying, increased durability against wear and erosion. Typical applications of resins include industrial

flooring, bowling alleys, boats. Olefins are also being used profitably in the manufacture of rubber chemicals, germicides, insecticides, dyes and surface active agents.

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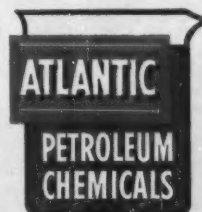
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SPECIALTIES

Floor Plan: The paint grinding division isn't the only group making news. The janitor supply section (waxes, cleaners, varnishes, sealers; but no washroom sanitizing chemicals) is readying a rugged new floor polish compound with carnauba and polyethylene (see p. 49), will make it available by September.

The firm manufactures the janitor supplies (about 45% of the total sales of the firm; another 10% is printing ink vehicles) both under its own name and on a contract basis.

Household Word: Despite the activity in its several divisions, Washburn still figures its thixotropic vehicles are about the most spectacular development of the 70-year old firm's history. Credited to Smith and George Tinker (now general manager), the vehicles were covered in patents granted in 1953, and heavy promotion of them was begun the next year.

The public took to the new material almost as eagerly as did paint makers—the ability of the paint to be a firm, nonspilling gel in the can, yet become a smooth spreading liquid when stirred or shaken, appealed to painters, and has almost made a household term of the word "thixotropy."

Polyamides—not the nylon type, but dimerized fatty acids (soybean) combined with polyamines—are united with alkyds to produce the gel resins (which Washburn tags Burnok). Polyamides (only supplier to Washburn is General Mills, Kankakee, Ill.) vary in the vehicle from 1 to 10%; in paints, the jel-alkyd can also be varied with conventional vehicles over an equally wide range, to impart such advantages as smooth brushing, minimal dripping and settling.

Washburn sought to emphasize its Burnoks (protected by patents) in '54, after sales had leveled off at the



Chemical De-Icing Candidate

PLOT THE performance of military aircraft like this high-flying B-52, and you find plenty of potential for altitude and speed. But the weight penalty such a plane must pay for anti-icing equipment is steep. In an effort to reduce the load, Wright Air Development Center is trying anti-icing chemicals—Armour Research Foundation is doing much of the testing. Some of the best bets so far: Mixtures of

plasticized polymerized ethylene glycol; dispersions of lithium chloride in a matrix of polyvinyl alcohol. Applied before take-off, these materials function while the plane climbs through icing conditions. Also, after application, the anti-icers can be covered with a water-insoluble film. As plane descends, film is ruptured electrically, releasing the chemical to do its job—as long as it lasts.

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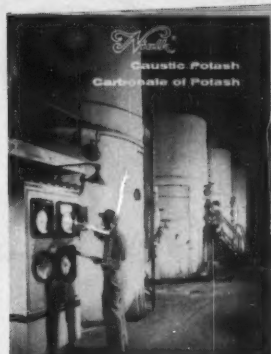


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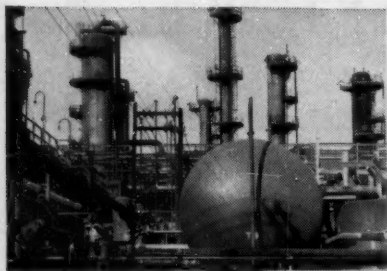


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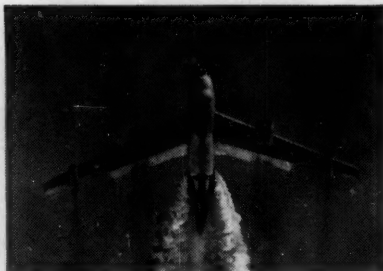
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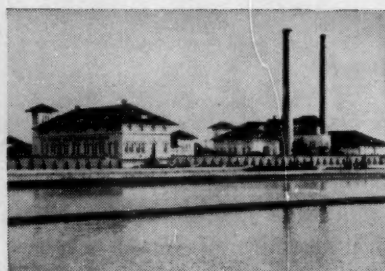
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ISOTRON

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tured with the rigid quality control you expect of Pennsalt. Optimum quality and uniformity are assured.

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PRODUCTION



A big automobile maker calls. Someone has turned a wrong valve and he now has a large quantity of methanol mixed with a large quantity of glycol. Can they be separated economically? Would you like to buy the mixture? How much would you pay?

On the other end of the phone, Ed Trueger (right) does some mental calculations, says he's interested and quotes figures for additional negotiations. Chances are, he'll find that the literature on separating methanol from glycol by distillation is pretty slim. But that's nothing new for Trueger. Since 1947, he and Dan Friedland (left), his partner, have quoted costs in uncharted distillation areas.

They're Selling "Don't Do It Yourself"

A new distillation plant, rising on the grounds of Trubek Laboratories in East Rutherford, N.J., stands in tribute to the engineering ability and business acumen of two young men who created a small but thriving business in the refining of solvents.

Their names are Ed Trueger and Dan Friedland, and their company is Truland Chemical Company. Originally, they did only custom refining. That is, they'd distill materials on a toll basis. Now about half their business consists of buying material outright, cleaning it up and then reselling it. And if Trueger and Friedland have their way, more and more of their business will be done that way.

A milestone in the history of the small company came last fall when it was bought out by Trubek Laboratories, in which it now operates as a separate division under the management of Trueger and Friedland. That sale is now bringing them to a second milestone: a new plant that will triple the firm's refining capacity.

The present plant (in Union, N.J.) will be dismantled and the new one is going up adjacent to Trubek's plant in East Rutherford, N.J. It will have all-steel stills and will be able to handle over 3 million gal./year. The schedule called for it to be in operation by August, but a cold spring

pushed back the construction schedule at least a month.

Aside from larger capacity, the new unit will incorporate some new design features. It will, for instance, be the first plant of its type to be all-electronically instrumented.

Question on Sales: Just how much this new plant will mean in terms of revenue is debatable, because Trueger and Friedland have never released figures on their operations. But if operated at capacity, it could mean a fair-size piece of business.

In their "toll" business, they charge anywhere from 2¢ to 10¢/lb. for distillations. The average cost would probably come out to 3¢/lb. That would mean that if all their business were done on a toll basis and if they operated at capacity throughout the year, Trueger and Friedland would contribute close to \$1 million to Trubek sales.

Casual Meeting: Trueger and Friedland met on a train. In talking, they found that they lived in the same garden apartment house (in Roselle, N.J.) and that they were both en route to Brooklyn Polytech where they were studying for their doctorates.

After an early struggle typical of any starting firm, the two got their business on an even keel. They've managed to make it go, they feel,

because it fills a niche. They point out that because of their relatively large refining facilities they can do many distillation jobs cheaper than most small firms. On the other hand, they think their relatively small overhead gives them an edge on bigger firms.

Their increased interest in buying and then re-selling is evidenced by the fact that they now have a regular list of chemicals they sell. (Included: acetone, toluene, methanol, ethylene dichloride, isopropanol and diethylene glycol.)

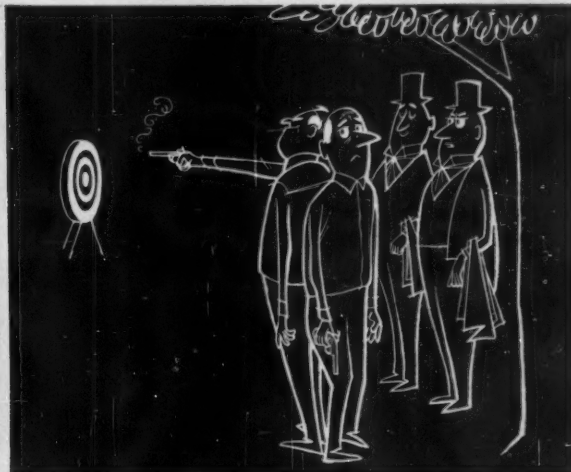
Their plans include setting up stainless steel and glass-lined equipment to handle corrosive chemicals. Too, they plan to get into more custom chemical processing, hope eventually to be able to do alkylations, chlorinations, hydrogenations and esterifications.

In its short corporate history, Trubek has amassed some diversified experience. It has, for instance, acted as an Eastern production arm for a large Midwest manufacturer. And, though it has concentrated in the chemical industry, it has done jobs for companies far afield; it helped, a lace manufacturer recover solvent, for example. In an age of "do-it-yourself," it has built a successful sales presentation around the theme: "Let us do it for you."

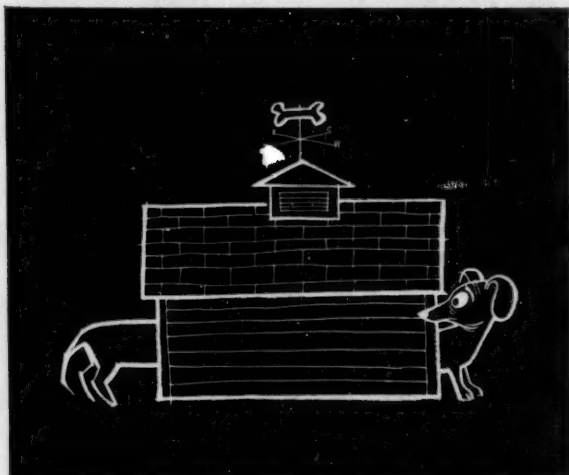
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INITIAL SURVEY AND ANALYSIS OF YOUR PARTICULAR PROBLEMS



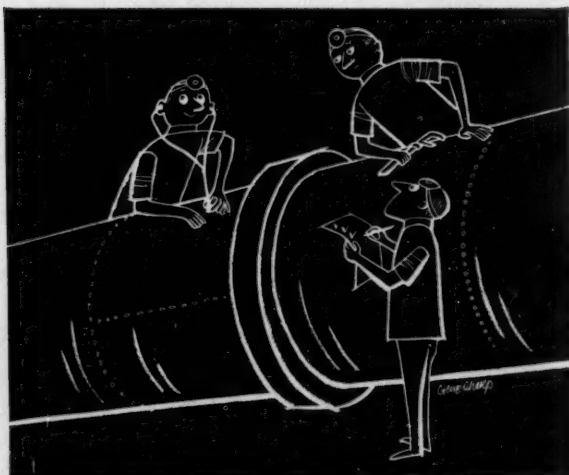
PRE-TESTING IN PILOT-PLANT OPERATION TO ASSURE PERFORMANCE



ACCURATE DESIGN TO MEET YOUR SPECIFIC NEEDS



TOP-QUALITY FABRICATION IN GENERAL AMERICAN'S OWN SHOPS



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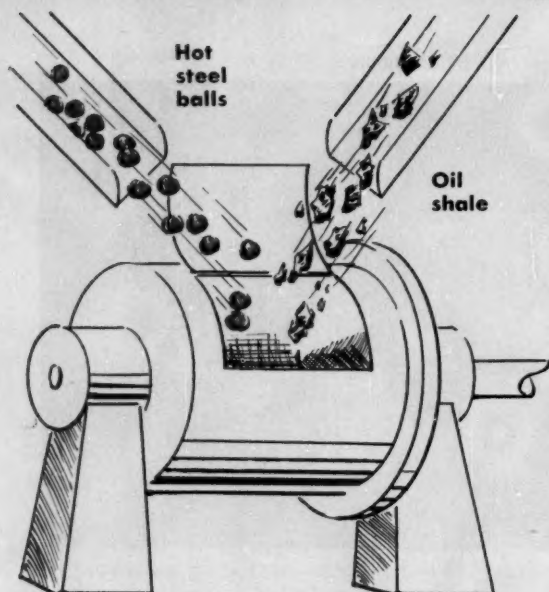
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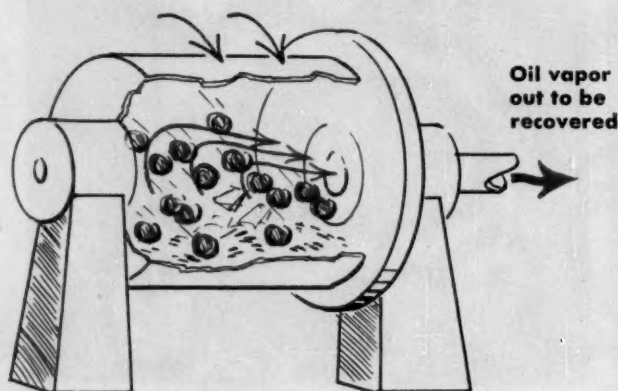
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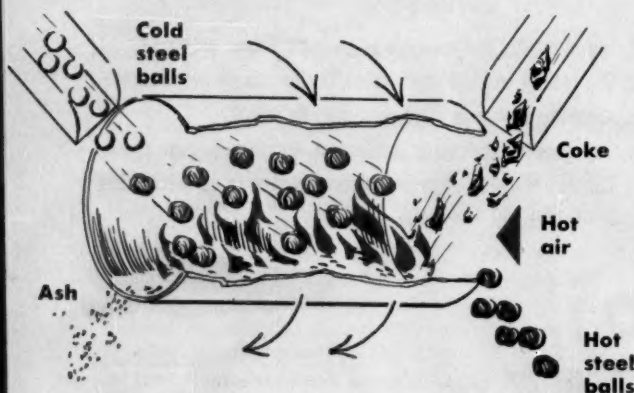
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- 1 Oil shale is charged to mill containing steel balls at 1,000F.



- 2 Oil is vaporized as hot balls break up shale in absence of air.



- 3 When vapor recovery is completed, coke-bearing spent shale is burned to reheat balls for next charge.

Oil Shale: Tumbling to a Comeback?

With the discovery of petroleum in 1859, oil shale ceased to be an economic source of liquid fuel. This week, many years and many unsuccessful attempts later, oil shale is striving to make a commercial comeback via a new route—the Aspeco pyrolysis process. First step on the new road back: a \$100,000, 2,000-lbs./hour pilot plant soon to be constructed in Denver (*CW Technology Newsletter*, June 2).

Developed by Aspengren & Co. (Stockholm, Sweden), the process is being pushed in this country by Oil Shale Corp. (Beverly Hills, Calif.), holder of the American rights to the process. It's OSC's hope that the new pyrolysis will prove to be an efficient means of tapping the estimated 100 million barrels of shale oil in the company's recently acquired 1,300-acre tract near DeBeque, Colo.

Denver Research Institute, under contract with OSC, has been operating a continuous 300-lbs./hour plant that paved the way for the proposed pilot installation.

A Combination: Though design details of the ton-per-hour pilot plant still need a few finishing touches, the pre-pilot system has more or less proved the feasibility of the Aspeco process. Essentially, it's a pyrolysis of oil shale in the absence of air. But, unlike conventional methods which utilize retorts, the Aspeco process produces shale oil by a combination of heating and tumbling in a horizontal ball mill (see illustration).

Key to the tumbling pyrolysis is the method of carrying heat to the crushed shale without exposing it to combustion. This is accomplished by use of steel balls, preheated to about 1,000 F, to break up the raw oil shale in the revolving mill. In the ton-per-hour installation, heat will be supplied to a 2-ft.-diameter, 5-ft.-long ball mill by 6,000-8,000 lbs./hour of 1- to 2-in.-diameter steel or aluminum oxide balls.

Decomposition of the crushed shale yields about 25 gallons of shale oil, 29 lbs. of 725-Btu./cu. ft. gas per ton of shale. Spent shale, which contains 4-5% of a carbonaceous residue, leaves the pyrolysis drum at about 900 F, is burned with preheated air to reheat the balls in a separate rotating combustion chamber. Combustion gases from the ball-heating drum are passed through a heat exchanger to preheat the air used for combustion; depleted shale ash is discarded.

Large Plant Later: Denver Research Institute has awarded Stearns-Roger Manufacturing Co. (Denver) the contract for the construction of the pilot plant, hopes to have it in operation in October. The big job will then be to determine the commercial feasibility of a large-scale plant—the final step along the comeback trail.

NEWS about Nitroparaffins in use!

Just released for industry use: a new 48-page book presenting the latest information on nitroparaffins and derivatives as revealed in a series of recent symposiums.

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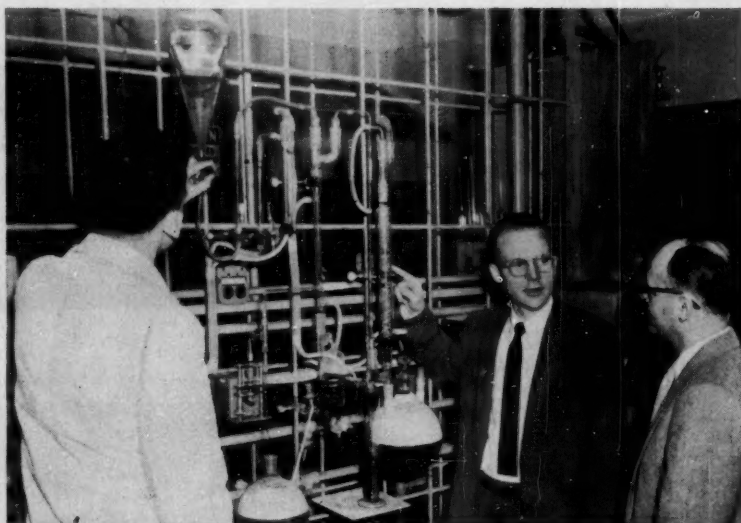
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PRODUCTION



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Better Yields from Chlorate

Increased demand for brighter, higher quality paper has, over the past year, more than doubled pulp mills' appetite for chlorine dioxide bleaches. To make this high-priced diet more efficient—and more palatable to cost-conscious pulpers—Olin Mathieson last week unveiled a new chlorine - dioxide - generation process that, it claims, may save pulp mills as much as \$7,000/year per ton-day of chlorine dioxide produced (CW Technology Newsletter May 26).

In cooking up the new bleach process, OM researchers added a pinch of salt. As little as 0.06-0.08 lbs. of sodium chloride per lb. of sodium chlorate, they found, produced almost quantitative yields of ClO_2 , suppressed undesirable side reactions.

Easy Adaptation: Present point-of-use generating systems produce chlorine dioxide by the reduction of sodium chlorate with sulfur dioxide or methanol in an acid medium. But concomitant yield of sodium chloride and chlorine gas (generator gas usually runs 2-5% Cl_2) limits the output of chlorine dioxide to about 90% of the theoretical yield.

One attribute of the yield-boosting salt addition, says OM, is that it requires relatively simple modification

of existing equipment to add the salt make-up tank, necessary piping changes. A second advantage: since ClO_2 -forming reaction appears to be independent of the reducing agent used, salt addition can be applied to either the sulfur dioxide- or the methanol-process—or any other generating system that operates in acid.

First tests of the new process, conducted in a continuous bench-scale pilot plant at OM's Niagara Falls research labs, produced an increase in yield from 90 to 97% (based on chlorate). Subsequent commercial-scale operation in a mill showed only 5-6% improvement. But OM believes that, with a little more polishing, mills will be able to achieve the same improvement that has been demonstrated in the laboratory.

Savings Add Up: Though the total saving effected by the addition of sodium chloride is only 1.1¢ per lb. of chlorine dioxide produced, it adds up to about \$70,000/year in a 10-ton/day generator. What's more, the reduction of chlorine in the bleach (from a normal 2-5% to less than 1.5%) minimizes degradation of the pulp.

With all this in its favor, says OM, the new generating process should go a long way toward promoting the use of chlorine dioxide for upgrading quality paper products.

*L. to r., research chemist D. J. Jaszka, project supervisor T. H. Dexter, research director B. H. Nicolaisen.



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On another corrosion-fighting front, Pittsburgh recently introduced *Tarset*, the first relatively low-cost cold-applied coating ever developed to effectively protect equipment against crude oil corrosion. *Tarset* also shows exceptional promise in combating severe chemical and marine corrosion.

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Technology Newsletter

CHEMICAL WEEK
June 23, 1956

Standard Oil Co. of Indiana's rigid-polyethylene process will get its first commercial tryout in a proposed Texas Eastman plant at Longview, Tex. The last week revealed that construction will begin promptly on a semicommercial manufacturing unit that will be used for experimental production.

Licensing arrangements completed last week grant Eastman Kodak Co. (Texas Eastman's corporate parent) nonexclusive rights to produce high-density polyethylene and polypropylene plastics (*CW, June 16, p. 79*) under more than 20 patents issued since 1951 to Standard Oil.

The continuous process employs Standard-developed catalysts which, the company claims, are superior to those used in other low-pressure processes. Granular solids, these catalysts do not require regeneration, can be filtered out of the product to give polyethylene of low ash content.

Union Carbide and Carbon is covering itself two ways in plans to boost low-pressure polyethylene capacity by 55 million lbs./year. New plants at Institute, W.Va., and Seadrift, Tex., will both be equipped to utilize Ziegler and Phillips low-pressure processes, in addition to olefin polymerization improvements developed in Carbide's own labs and pilot plants.

The Institute unit—a plant to be converted from other production—is scheduled for completion early in '57, the Seadrift facility for a few months later.

You can expect to hear more about a one-step chlorination process recently developed by the Bureau of Mines' Albany, Ore., station for the recovery of metals and rare earths from black sands.

Though they're an excellent source of columbium, tantalum, titanium, uranium, among other elements, black sands also run high in iron, which thwarts attempts to simplify the classic caustic fusion-acid leach separation process. Mallinckrodt, too, has developed a method (described only as "conventional"), which it uses in the recovery of columbium, tantalum and uranium values from euxenite placer mined by Porter Bros. Corp. (Boise, Idaho) at Bear Valley, Idaho.

Key to the new Bureau of Mines process is an addition of 2-4% sodium chloride, which promotes formation of stable, nonvolatile ferric chloride complexes. The black sands may then be chlorinated directly to volatile metal chlorides. Titanium tetrachloride vapor comes off first, is condensed at cold-water temperatures. Next, columbium and tantalum chlorides are condensed in a separate vessel, subsequently separated by selective hydrolysis. Nonvolatile residues may be treated by other conventional methods.

Advantages of the one-step process: simple equipment, low-cost materials, easy-to-refine (by Kroll reduction) products.

Technology

Newsletter

(Continued)

Fresh flavor can now be restored to processed foods, according to findings presented last week at the Institute of Food Technologist's annual meeting in St. Louis. Food technologists of Evans Research & Development Corp. (New York) reported that by adding the right enzymes to heat-processed foods, they can release latent flavor—locked up in the food in the form of flavor precursors. Next step: a search for specific enzymes for each food. Potential sources of enzymes reportedly are materials biologically related to the food in question.

Besides having potential in canned, frozen, dehydrated foods, the method is expected to have a place in the now-developmental irradiated food field.

The work—still in the fundamental stage—was a joint research effort of U. S. Army Quartermaster Research and Development Command (Natick, Mass.) and Evans Research & Development Corp. (New York).

Minute quantities of gibberellic acid are a powerful growth stimulant for certain plants, according to preliminary investigations at the U.S. Dept. of Agriculture's Agricultural Research Center, Beltsville, Md. Applied externally in a lanolin paste mixture, the acid caused some ornamentals to grow from one-half to three times taller than untreated specimens. It boosted growth of willow oak, tulip poplar and maple trees, but had little effect on two species of pine and white spruce.

The U.S.D.A. emphasizes that it is not possible to reach any firm conclusions on the basis of experiments done so far. But such work is potentially significant, particularly as a means of replenishing pulp woods. There's evidence, too, that other groups are looking at gibberellic acid for the same reason.

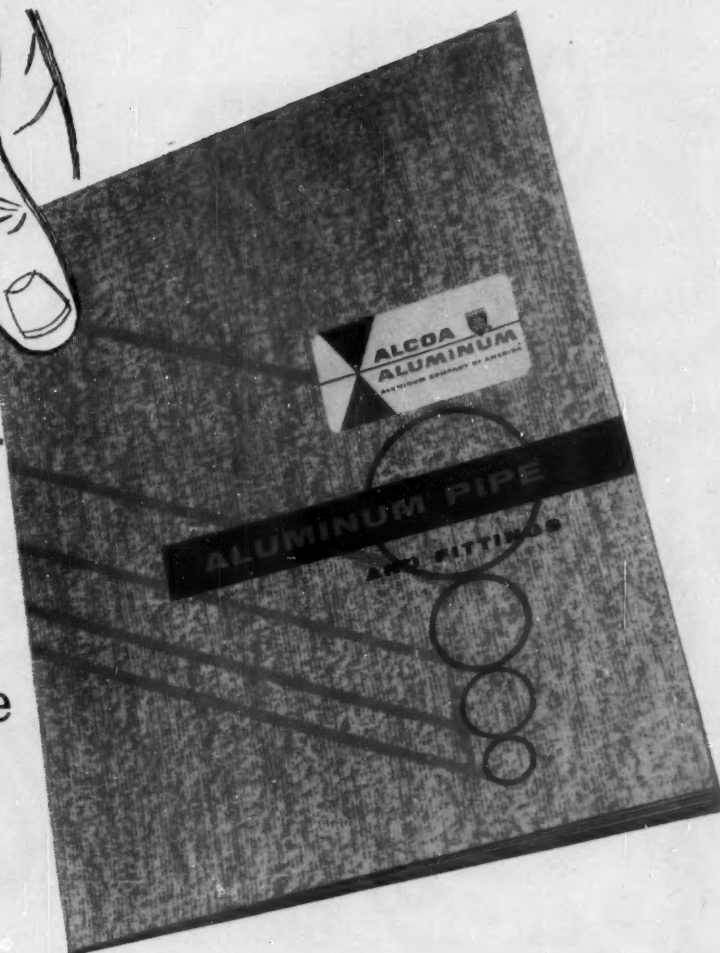
The hitch: even if the chemical—a complex, fungus-derived acid—lives up to its early promise as a growth regulator, there's not enough available to go around—despite the fact that as little as one part per million gibberellic acid in water seemed to give a pronounced effect. But further successful experiments should send researchers scurrying for a good synthesis.

The Atomic Energy Commission last week revealed that it has given Armour Research Foundation the green light to operate its new nuclear reactor (see p. 44)—also that it has given the foundation a license to acquire 1,300 grams of uranium-235 (in uranyl sulfate solution) to fuel the plant.

The AEC announcement came on the heels of an important decision to hike refined uranium output: it signed a contract with Union Carbide and Carbon, whereby the firm will build and operate a new uranium processing mill at Rifle, Colo., and two new ore-receiving stations and chemical upgrading plants in Colorado and Utah.



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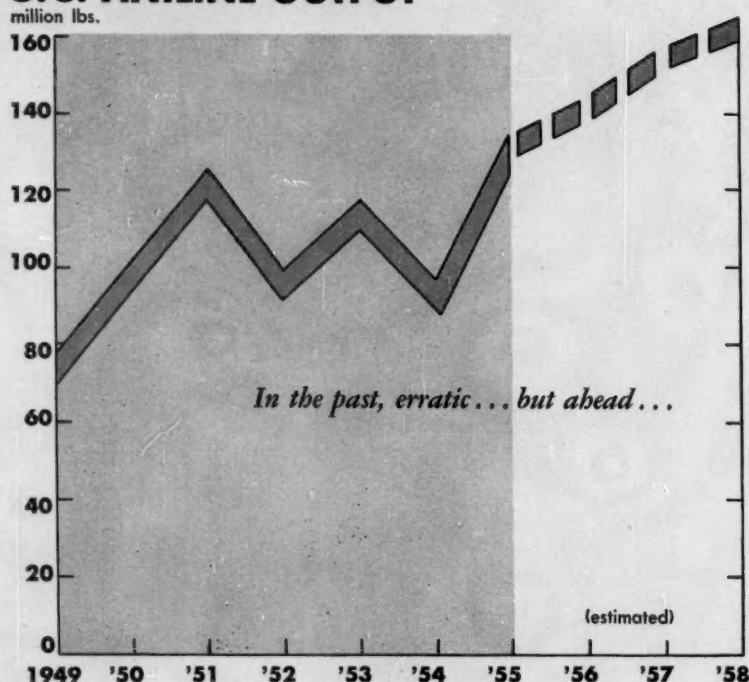
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MARKETS

U. S. ANILINE OUTPUT



The Climb Is Steadier

Over the past few years, production of aniline in the U.S., in contrast to that of most other chemicals, has traced a downright erratic pattern. But the era of aniline dip and surge may well be over. Output, during 1956 and in the foreseeable future (see chart), appears to be headed for a consistent annual step-up—a trend begun last year when production reached some 132 million lbs., or slightly more than 40% over that in '54.

How high will the output curve go? That, say the country's chief marketers, will depend on the vagaries of demand. But, tied as it is to a relatively few major consumers (e.g. rubber, textiles, veterinary pharmaceuticals), it's unlikely that production will soon really strain full U.S. potential, even with a solid 150-160 million lbs. of customer needs anticipated by 1958.

Reason, of course, is that capacity here keeps leap-frogging ahead of demand—a long-time characteristic of the aniline supply/demand picture. This backlog of capacity may well

have been good insurance for consumers, leading to a remarkably steady price over the years; the current price of 20¢/lb. (tanks) has been in effect for about the last three years. Latest capacity jumps:

- A fortnight ago, National Aniline's second unit at Moundsville, W. Va., went onstream, marking completion of the company's capacity-doubling since the plant started operations just about a year ago.

- American Cyanamid, another major aniline producer, will begin construction immediately of a new 24-million-lbs./year plant at Willow Island, W. Va. Production is scheduled by the fall of '57.

National, using its unique continuous, vapor-phase catalytic process, will have no difficulty obtaining necessary raw materials; mixed acid, benzene and hydrogen are all available within the Allied complex.

Cyanamid's new plant will also be unique—it will use, for the first time, a fluid bed reactor and a new catalyst to make aniline by reducing nitroben-

zene. The Willow Island installation will include units for nitric acid, nitric and sulfuric concentration, and nitrobenzene, as well as aniline.

Although these are the only two aniline makers to date to reveal plans for expansion, there is some persistent trade speculation that others are thinking along the same lines.

(National, American Cyanamid, Dow and Du Pont currently account for the bulk of U.S.-made aniline. Ciba and Naugatuck also contribute to the production pot, but the latter's primary interest is for captive uses.)

Goal Breakthrough: Even without further expansions, the two already announced will push total U.S. aniline output capability well beyond the old Defense Production Authority's 1955 goal of 135 million lbs./year.

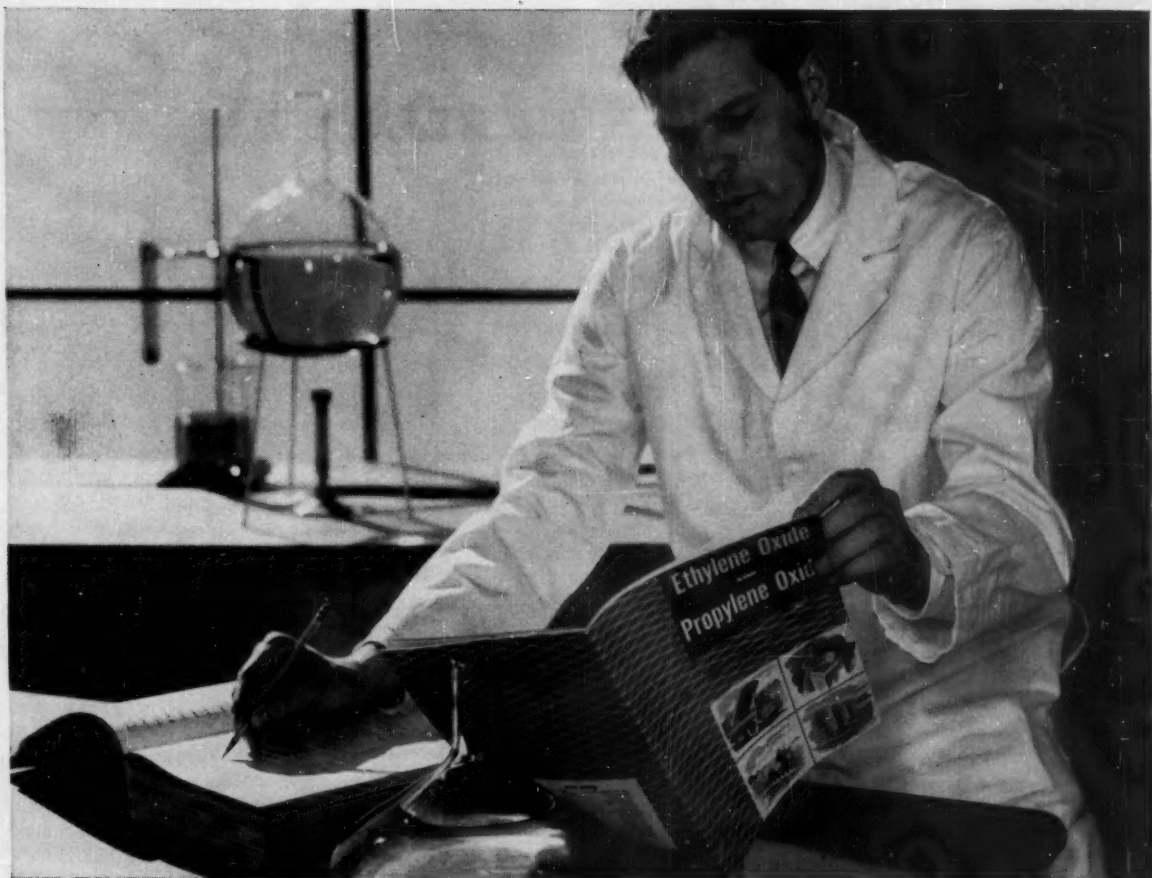
Actually, producers were able to turn out that much material well ahead of DPA's capacity target date. But only once did the industry come anywhere near striking distance of capacity production. That was during '51—peak year for many chemicals because of the Korean war—when nearly 123 million lbs. of aniline were produced.

Last year's output of 132 million lbs., in addition to its near-9-million-lb. topping of the previous high, and its giant jump from '54's somewhat depressed 94-million-lb. production, is noteworthy for yet another reason: marketers believe it marks the beginning of a steadily increasing, rather than vacillating, growth toward the big time.

By the end of '56, for instance, many envision aniline output reaching some 142 million lbs. Too, there's little hesitation in predicting a good 13-million-lb. increase next year.

Rubber Tie-in: The biggest aniline outlets have been—and will continue to be—rubber chemicals, and dyes and intermediates consumed by the textile trade.

The surge of synthetic rubber demand, sparked by the wartime cutoff of natural rubber supply, has been the prime pusher for aniline consumption during the past decade or so. This year alone, rubber customers may require about 150 million lbs. of antioxidants and accelerators—most of them derived from aniline—and the future indicates no slackening in need.



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MARKETS

Estimated Aniline End-Use Pattern, 1958

	(Million lbs.)
Rubber chemicals (chiefly anti-oxidants, accelerators)	90-95
Dyes, intermediates	20-21
Veterinary pharmaceuticals	10-12
Drugs	5-6
Photographic chemicals (chiefly hydroquinone)	3-4
Other	20-25

A few weeks ago, the President, in his report on the first anniversary of the disposal of 24 of the 27 government-owned synthetic rubber facilities, told Congress that total U.S. demand for new rubber—natural and synthetic—by 1960 may hit some 1.7 million long tons/year.

Fact is that within two or three years, planned capacity will jack synthetic potential alone to near the 1.7-million figure.

Although both natural and synthetic rubber use aniline, synthetic takes about 40% more accelerators for vulcanization. Thus it's not unreasonable to foresee a market for 90-95 million lbs. of aniline in rubber manufacture by 1958 (see end-use pattern).

Textile Tack: In the last year or two, there's been a satisfying pickup in textiles—and with it a concomitant recovery in dyestuff consumption—which has further spurred aniline use. Dyes and intermediates years ago relinquished the top spot in aniline consumption to rubber chemicals, but use in this category, currently running at about 19 million lbs./year, will likely continue in the No. 2 slot for some years to come. Aniline consumption in textiles will grow moderately, of course, compared with rubber's requirements, and in the next two or three years check out at a rate of 20-21 million lbs./year.

Few textile market observers expect their industry to slump again soon, as it did in the recent past. Interest in synthetic fibers and blends will help brighten textile prospects—and with it continue to nudge aniline need.

The Take Spreads: Although rubber and textiles are the strongest aniline props, some outlets continue to show signs of moderate widening, while others may well explode demand for the intermediate beyond the industry's

ability to satisfy all of the future needs.

In the first category of likely steady aniline takers is the field of veterinary medicine. Sulfa drug consumption by animals, for example, long ago surpassed the amount consumed by humans, and the practice of emphasizing better livestock care will continue to take, albeit indirectly, more and more aniline.

Diphenylamine, another aniline derivative, was formerly used by vets almost exclusively for sheep, but then was found to be effective for cattle as well. Of late, though, the swing in such use appears to be away from the derivative and to the aniline itself. But no matter how it's used, aniline consumption in veterinary pharmaceuticals will continue at a respectable rate. The '58 estimate: 10-12 million lbs.

Hydroquinone, too, best known as a photographic chemical, is spreading out, and will need more aniline. Already, food additive compounds requiring hydroquinone have grown to a sizable business, and there's much research going on hydroquinone-based anti-oxidants for edible oils. Add, too, gum inhibitors for motor fuels.

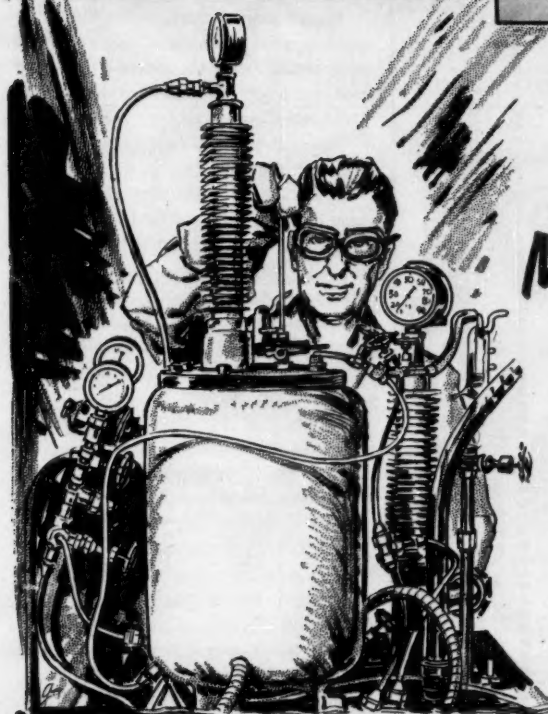
But if there's any outlet that could really strain aniline capacity, now or in the future, it's a war-wrapped government. Many explosives stem from aniline, of course. But aside from this known use, are a raft of little-discussed possibilities. One: as a constituent for intercontinental ballistic missiles fuel.

Such potentially explosive aniline uses, though, aren't as important in aniline makers' plans as the established outlets. And these demands, paced by ballooning rubber expansions, and healthier textile needs, will, over the next three years at least, keep aniline trailing not too far behind capacity.

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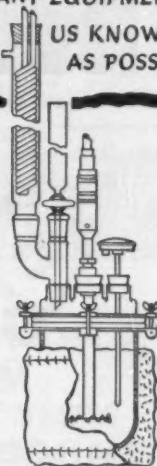
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ORGANIC
PEROXIDES**



**LUCIDOL DIVISION
WALLACE & TIERNAN INCORPORATED
BUFFALO 5, NEW YORK**

MARKETS

Export Baedeker

Bigger export markets for the \$200-million/year U.S. pesticide business may result from the release of a vast new reservoir of information by the Dept. of Commerce.

Statistics-packed reports now available for the first time are:

- Detailed up-to-date reports on pest control markets in 67 countries, prepared by U.S. consular officials abroad; the Business and Defense Services Administration and U.S. pesticide firms called the shots on what facts and figures would best serve this country's producers.

- "World Survey of Pest Control Products," a 213-page summary of the individual country reports.

- A list of business agents in overseas countries who are able to handle pesticide sales—and who are looking for such U.S. contacts.*

This world-girdling reporting job—supervised by BDSA's international consultant C. C. Concannon—provides a quick and inexpensive method of spotting those areas where U.S. producers would meet stiff competition from home-base output and from other exporting countries.

It takes an educated look at marketing prospects for the next five years, points to areas where there is room for American pesticide makers to expand sales.

The report also spots some problems. For example: U.S. pesticides, though popular, face increasing price competition from European-made products. German and British competitors generally offer more liberal credit terms than do U.S. firms; American products are often improperly advertised through poor use of the native language.

Incidentally, best prospects seem to lie in the promotion of tailor-made products for special purposes—products now emphasized in this country and not yet made abroad.

In general, BDSA experts are highly optimistic about the future of U.S. pesticide exports despite competition from other countries. And the government's new guides, they believe, will do much to boost pesticide exports even higher than last year's record \$79-million level.

*The World Survey is available from the government printing office at 60¢/copy; the detailed country reports and list of business agents won't be published but can be inspected or loaned at BDSA's Chemical and Rubber Division.

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.



Published by The Pfaudler Co., Rochester, N. Y.

Now you can outsert leaflets on most packages without hand labor!

Put your product story where it will be read—on a leaflet fastened to the outside of your package. You can do this, without slowing down your production line or using costly hand labor, by using Pfaudler's new fast-action Outsert Applicator, Model OA-3MC.

Up to 220 containers per minute

The Pfaudler Outsert Applicator attaches your message to all cylindrical containers of plastic, glass, paper, or metal—2½ to 7¼ inches in length, 1¼ to 6½ inches outside diameter. (Special designs for containers outside these limits.)

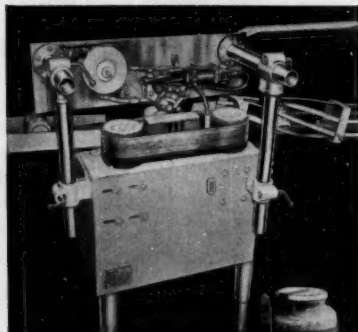
Fits right into your production line

The unit fits readily into most production line setups, requires only four square feet of floor space! There it operates automatically and continuously, gripping free-rolling containers from your labeling machine and forwarding them, with leaflet accurately attached, to the casing machine, ready to pack and ship.

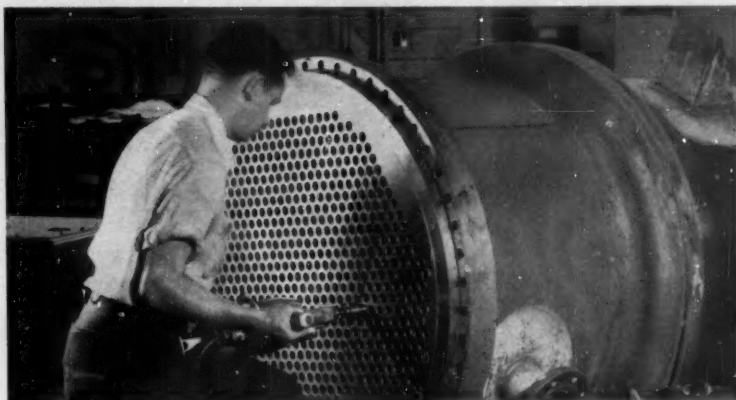
Low maintenance cost

Advanced design and careful selection of materials give you a durable machine, capable of long continuous runs. And there are no delicate mechanisms to fail.

If you're interested in the advantages of outserts for your product, simply forward a sample labeled container with outsert affixed correctly. Pfaudler engineers will analyze your requirements and send you full information. Or, if you prefer, write for Bulletin 933.



Pfaudler Outsert Applicator attaches message to your package automatically (insert).



GET 2-WEEK DELIVERY on these flexible standard heat exchangers

Interchangeable parts are essential to the cornerstones of industrial progress. But in the chemical processing field, standardization is hard to achieve because of the great variety of requirements. Traditionally each system has had to be specially engineered.

Today it is unnecessary, in many cases, to delay your operation by waiting months for "made-to-order" heat exchangers. With the flexibility provided in Pfaudler's standard line of equipment, you can solve many process problems in two weeks—without resorting to special complicated designs.

Any one of the five sizes of Pfaudler stainless steel heat exchangers listed below can be speeded on its way to your plant.

Pfaudler's new stocking program, plus standard design, make this "off-the-shelf" delivery possible. These units are ready for almost immediate shipment and are all fixed-tube sheet design. Shell and baffles are made of carbon steel; tubes, tube sheets and bonnets are stainless steel.

These stock units may be used in vertical, horizontal or inclined positions, as specified on your order.

General specifications:

Design Pressure: 150 psi shell side; 75 psi tube side.

Design Temperature: 350° F.

Shell and Baffles: Carbon steel.

Tubes: Stainless steel, Type 316, ¾" O.D., 18 gauge, welded.

Code: Built to ASME Code U-69, but not stamped unless specified.

Diaphragm: None.

Support Lugs, Ears or Saddles: Shipped

unattached, or, attached if desired location furnished.

Tube Sheets and Bonnets: Stainless steel, Type 316.

Stockpiled sizes

56 sq. ft. size—8" nominal shell diameter;

72" tube length; baffles on 4" centers.

104 sq. ft. size—10" nominal shell diameter;

96" tube length; baffles on 5" centers.

148 sq. ft. size—10" nominal shell diameter;

120" tube length; baffles on 5" centers.

216 sq. ft. size—12" nominal shell diameter;

120" tube length; baffles of 6" centers.

316 sq. ft. size—14" nominal shell diameter;

144" tube length; baffles on 7" centers.

If none of these exactly fit your needs, a wide variety of other sizes are also available for fast delivery. We can help you with unusual jobs, too. Please ask us about them.

Pfaudler will build heat exchangers to meet your special requirements in many different alloys including Nickel, Inconel, Monel, Hastelloy, Titanium and Karbate. Although Pfaudler standards are based on ¾" tubes, we can give you designs for any required tube size, and any temperature or pressure.

Engineers in the Pfaudler heat exchanger design department are at your service to work out the answers with you. Why not get in touch with them when you have a special heat exchanger problem? And write for your free copy of Manual Number 837 titled, "Pfaudler Heat Exchangers and Condensers." This manual contains valuable performance and thermal design data as well as a complete description of Pfaudler heat exchangers and condensers.



These two experts can help solve your methyl chloride and methylating problems

Our Messrs. Neuville and Zellner (left to right above) cover all the bases when it comes to methyl chloride application and the special field of methylation. They come by their particular specialties honestly. Since 1936 Ansul has been a constant and expanding source of supply for bulk methyl chloride in the domestic and export markets. In the field of methylation alone (Morrie Neuville's specialty) Ansul has successfully methylated more than 100 compounds.

The methylation laboratory at Ansul is equipped to take over a methylating problem of yours at any stage of development. Manufacturing facilities for producing

commercial quantities of a methylated compound to your specification are also available.

As a major producer of methyl chloride, Ansul is prepared to supply you with quantities ranging from laboratory containers to cylinders of 100 pounds, 140 pounds, and 1,300 pounds. Tank cars of 40,000 pounds and 78,000 pounds are available. Delivery is prompt.

For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville. THE ANSUL CHEMICAL COMPANY, DEPT. C-12, MARINETTE, WISCONSIN.



Market

Newsletter

CHEMICAL WEEK
June 23, 1956

The plastics industry is rife with rumors about a special-price deal brewing in the sale of styrene monomer. Just about every plastics marketer seems to know—though none will yet admit officially—that one large consumer of rubber-grade styrene is dickering for a sizable price cut on a 100-million-lbs. year order in return for shelving plans for its own plant.

It's no news that styrene makers are having trouble moving the monomer, are in a mood to make some concessions; only last week (*CW Market Newsletter, June 16*), the price of the rubber-grade material in tank-car quantities was dropped $\frac{1}{2}$ ¢/lb. to 16¢, to stimulate more bulk buying.

The rumored contract—reportedly involving two major styrene producers—would call for a price as low as 12¢/lb. Such a drastic cut, say some observers, could stem from the desire of styrene makers to keep the rubber companies out of styrene production—a wish that may have been translated into action by Firestone's recently announced plan to build a 100-million-lbs./year styrene plant at Orange, Tex. Styrene makers may be willing to go a long way to forestall similar plans by other big consumers.

As expected (*CW Market Newsletter, June 16*), most alcohol marketers wasted no time following Publicker's lead in upping ethyl alcohol prices. Right down the line, other producers have rewritten tags to read 5¢/gal. higher for most formulas; 190-proof tax-free material, for example, is now quoted at 47¢/gal. in tank-car quantities.

Freon users in several Western states will benefit from Du Pont's reduction of propellant and refrigerant prices. Now in effect, a 0.7¢/lb. cut drops from 1.5¢ to 0.8¢/lb. the differential between delivered bulk prices in seven states (Arizona, California, Idaho, Nevada, Oregon, Utah, Washington) and the rest of the nation.

The new listings peg Freon-11 at 22.4¢/lb., Freon-12 at 26.4¢/lb., both f.o.b. East Chicago, Ind., minimum transportation allowed. The reduction also applies to propellant solutions of the two Freons. Tank-car price of a typical 50-50 solution is 22.1¢/lb.

Purpose of the adjustment is to encourage the Western aerosol industry to use West Coast loaders. Products affected will be manufactured at a new plant in Antioch, Calif., beginning in September.

Phenolic resins continue to reflect the recent phenol price hike. Following price adjustments by General Electric (*CW Market Newsletter, June 16*), Monsanto this week is posting across-the-board $\frac{1}{2}$ ¢/lb. increases (effective July 2) on Resinox phenolic molding compounds.

At the same time, Resinox phenolic varnishes, resin compounds and liquid resins will be priced $\frac{1}{2}$ ¢ to 1½¢/lb. higher; Resinox phenolic adhesives will cost from 0.4¢ to 0.6¢/lb. more.

On the other hand, there's another price break coming for nitrogen solution users. For the second time within a month, Nitrogen Division

Market Newsletter

(Continued)

(Allied Chemical) will lower upcoming fertilizer year tags on some of its Arcadian solutions. New \$4 reductions establish these prices next week: Nitrana, Urana, and UAS (urea-ammonia solutions), \$120/net ton nitrogen; Seran solutions, \$144/net ton nitrogen.

Prices are f.o.b. Hopewell, Va., Southpoint, O., and La Platte, Neb., equalized on a delivered basis with cost of competitive solutions.

Introduction of two new styrene molding compounds—two months after completion of a monomethyl-styrene monomer plant expansion (*CW Market Newsletter*, April 21)—marks American Cyanamid's entry into thermoplastics.

Unveiled last week at the National Plastics Exposition in New York were products injection-molded from methylstyrene (Cymac 400). Heat resistance of the polymer is claimed to be higher than that of commercially available grades of polystyrene.

The other injection molding compound, based on methylstyrene-acrylonitrile copolymer (Cymac 201), features toughness and resistance to heat and crazing.

Polyvinyl acetate capacity has been doubled at the new Meredosia, Ill., plant of National Starch Products. It's the culmination of an expansion program, begun last fall, to meet growing demands of paint, adhesive, textile and paper industries.

It's now official that '55 was synthetic rubber's banner year. The Tariff Commission reports that synthetic elastomer sales climbed to 2,261 million lbs. last year, 58% above the '54 output and 13% above the previous record set in '51.

Rubber processing chemicals chalked up only a slightly less impressive production gain over '54—up 36% to 177 million lbs.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending June 18, 1956

UP

	Change	New Price
O-Anisidine, dms., c.l., frt. alld.	\$ 0.08	\$ 0.80
O-Chloroaniline, dms., c.l., frt. alld.	0.05	0.65
Coumarin, N. F., cryst., dms.	0.15	3.60

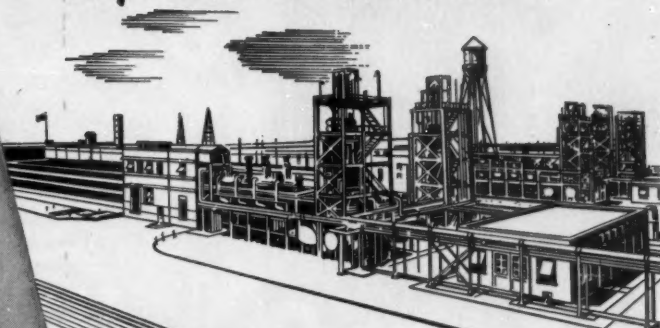
DOWN

O-Nitroaniline, flaked, dms., t.l., frt. alld.	\$ 0.05	\$ 0.49
O-Nitrochlorobenzene, dms., c.l., frt. alld.	0.05	0.15
O-Phenetidine, dms., t.l., frt. alld., E.	0.09	0.91

All prices per pound unless quantity is stated.

THE NEW STANDARD OF SYNTHETIC RUBBER

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Expanded Production*



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Firestone

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It's here . . . a great new name you'll be hearing more about in the future! It's FR-S (Firestone Rubber-Synthetic) — and it's more than just a new name, it's the **NEW STANDARD** of synthetic rubber!

In order to develop and produce FR-S, every step in Firestone's synthetic manufacturing process had to be modernized and new scientific methods of control and testing established . . . even the raw materials were required to meet **NEW, HIGHER STANDARDS**.

FR-S is available in latex or dry rubber . . . in drums or tank car . . . bales or carload. A Firestone Technical Representative will be glad to give you further information on FR-S and its applications. Phone or write Firestone, Synthetic Rubber and Latex Division, Akron, Ohio.



Firestone

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- Tall Oil Fatty Acids
- Refined Tall Oil
- Distilled Tall Oils
- Crude Tall Oil
- Tall Oil Pitch



Chemical Sales

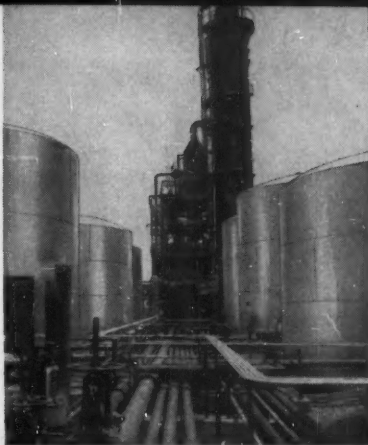
UNION BAG & PAPER CORPORATION
WOOLWORTH BUILDING, NEW YORK 7, N. Y.

Products

(Tall Oil Rosin)

(Tall Oil Fatty Acids)

With completion of new fractional distillation plant at Savannah, Union Bag becomes first manufacturer to produce and sell all basic tall oil products.



ALUMINUM STORAGE TANKS are used to produce and maintain product with outstanding color characteristics. Miles of aluminum and stainless steel piping serve the operation and inventory.

The most modern tall oil distillation plant in the world is now in operation in Savannah, Georgia.

The popular *Unitol* line has been expanded to include the complete group of tall oil distillation products manufactured in this new Union Bag plant. Union now is the only single source for all basic tall oil products: rosin, fatty acid, refined oil, distilled oil, crude oil, and pitch.

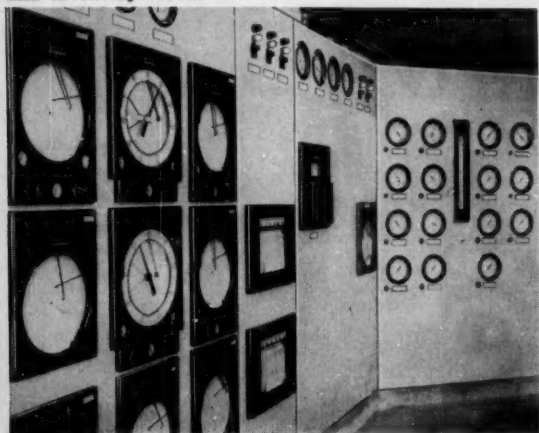
Demand for *Unitol* products is at an all-time high. The pine wood derivatives obtained in the Kraft paper manufacturing process are being used increasingly in protective coatings, soaps and cleaners, linoleum, textiles, adhesives, disinfectants, fungicides, emulsions, paper sizes and water-proofing agents.

Potentially, *Unitol* tall oil products have broad application wherever fatty acid and (or) rosin are employed.

Unitol ROS (tall oil rosin) and *Unitol ACD* (tall oil fatty acid) guarantee the user an outstanding competitive position. In color, odor, uniformity, and all other characteristics, *Unitol* products are outstanding examples of the high standard of development of the American chemical industry.

FOR INFORMATION ABOUT **UNITOL TALL OIL PRODUCTS**
Write Chemical Sales, Union Bag & Paper Corporation,
Woolworth Building, New York 7, N. Y.

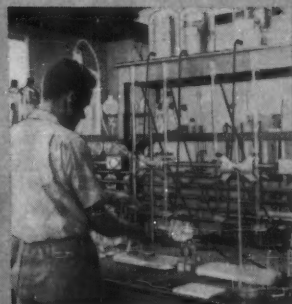
INSTRUMENT PANEL for automatic control at both processing and inventory levels.



QUALITY CONTROL LABORATORY MEANS BETTER UNITOL PRODUCTS FOR YOU



PALEST ROSIN YET. Technician compares rosin control cube with color standards.



HIGH FATTY ACID PURITY requires constant check, such as acid titration.

UNITOL PRODUCTS IN READY SUPPLY



SPECIALLY LINED *Unitol* tank cars guard against impurities, discoloration.



UNITOL ROS is packaged and shipped in standard rosin container.

SALES AND DISTRIBUTION



CROWDED: Two floors of machinery and materials went on display at . . .

Biggest Plastics Show Yet

More than 50 chemical companies vied last week with 250 other exhibitors for the fabricator's dollar at the 7th Annual National Plastics Exposition of the Society of the Plastics Industry. Trouping in under the butyrate-lettered marquee of New York's massive Coliseum, some 35,000 visitors saw a show accenting growth.

A prime sales target for the expansion-minded plastics industry was the building trade. Polyethylene again proved a major interest arouser. And a host of new raw materials and end-products made their debut.

Monsanto unveiled a scale model of its "house-of-tomorrow," which will be built almost entirely of plastic ma-

terials at Hollywood, Calif. Goodrich displayed such applications of rigid vinyls as calendered and vacuum-formed wall siding and roofing, extruded window frames and gutters, sponge insulation, calendered sinks, and vinyl-coated radiant heating wire.

Glass fiber reinforced polyesters also seem destined for extensive construction application. Most prime producers showed a variety of paneling adaptations. Although paneling is now the largest field for polyesters, major growth in "sandwich" type application is expected. Displays of thin sheets of polyester cemented to a core of foam or honeycomb filler were numerous and prominent.

Polyethylene showmen reported an unexpectedly high interest in fibers and monofilaments, though relatively little was exhibited. Kopper's showcase sported a polyethylene monofilament with a tensile strength claimed to top that of nylon and with good abrasion resistance. Low-pressure material was drawing inquiries for luggage, structural and other applications.

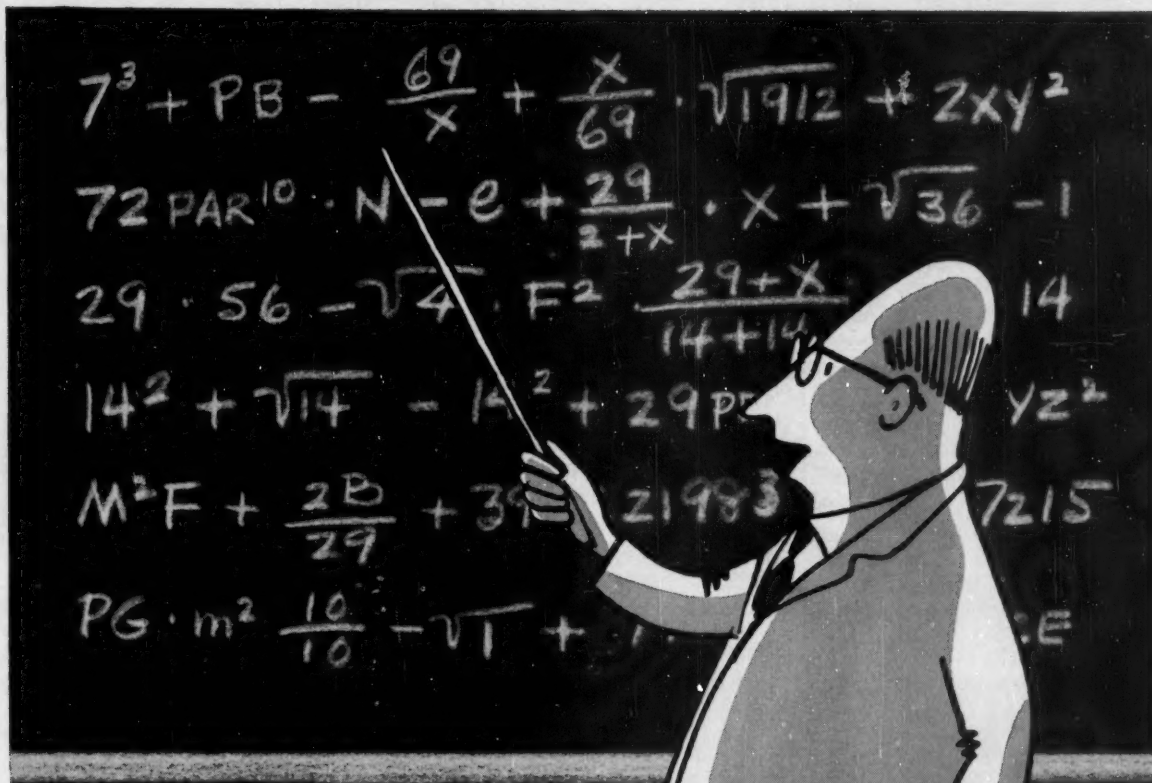
Foams—both vinyl and urethane—were also sparking queries. New applications, however, were few. Most displays featured conventional use in furniture, bedding, insulation and rug mats.

Raw Materials: Polystyrene formulations dominated the new products being introduced. Cyanamid offered new polymethylstyrene and acrylonitrile-methylstyrene materials. Both are claimed to be highly heat resistant, and the latter is resistant to chemical and solvent attack and crazing.

Dow launched a copolymer of styrene and acrylonitrile, plus four

PART OF 300: Exhibitors, such as these, invited attention and plenty of questions; hoped for some sales.





When we say "SERVICE" ...we prove it!

Over the past fifty years, we have spared no effort to prove to our customers that ours is an exceptional concept of service when it comes to supplying white oils, petrolatums and petroleum sulfonates.

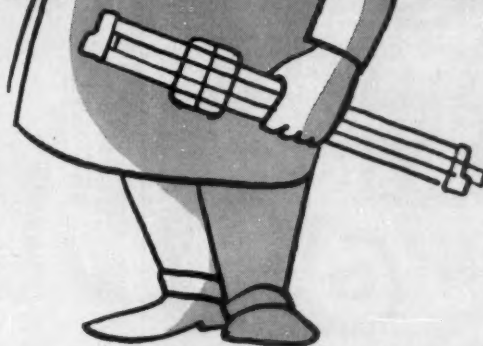
As proof of this contention, we have grown steadily, until today we are among the world's largest *specialists* producing these products. As such...

- we have a wealth of experience accrued over many years that we are ready to place at your disposal.
- we maintain laboratory facilities to help our customers solve their individual problems.
- we offer a wide range of these products—and will tailor-make them, if necessary, to meet your specific requirements.

... That our concept of service fits in with your needs, we stand ready to prove... if you will but telephone, wire, write, or fill in the coupon!



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- White Oil, Petrolatum & Sulfonate Div.
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Gentlemen:

Will you please send me Technical Data on the following:

- ☐ "General Information on White Mineral Oils"
- I.R. Bulletin "A"
- ☐ "General Information on Petrolatums"
- I.R. Bulletin "B"
- ☐ "General Information on Petroleum Sulfonates"
- I.R. Bulletin "G"

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IF YOU EVAPORATE SOLVENT NAPHTHAS...

... this message is for you. Solvent Naphthas, which ordinarily cost about 26¢ per gallon can be recovered for re-use for as little as 2¢ per gallon. That is the direct operating cost of a Barnebey-Cheney Automatic Solvent Recovery system.

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Acetoxypropanolone Acetate;
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Acetylacetone;
Acetylacetanilide;
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Acetylaminobenzotoluene;
p-Acetylaminobenzaldehyde;
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SALES

other styrene materials. High heat resistance and improved surface finishing are claimed for two high-impact styrene formulations.

The acrylonitrile-modified styrenes are expected to find use in picnic ware, hospital utensils, radio cabinets, rigid containers, dentures, and generally in most present styrene applications requiring heat resistance.

Other new materials up for scrutiny included:

- Phenolics. General Electric introduced two new formulations with improved heat-curing and handling characteristics.

- Diallyl phthalates. Ohio-Apex and Durez demonstrated the merits of this plastic over polyesters in cases where shrinkage control is critical.

- Polyvinyl chloride. A new Monsanto formulation features reduced

stickiness in finished materials.

- Nylon colors. Interchemical Corp. displayed a range of polyamide-based colorants for nylon materials.

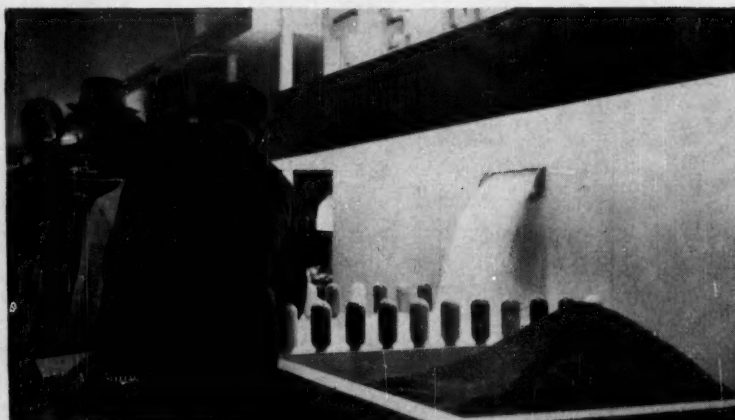
- Ethyl cellulose and saran. Dow introduced new versions of both these familiar plastics. The ethyl cellulose formulation is aimed at uses involving moving surfaces; the saran filament is designed for outdoor fabrics.

- Finished product highlights: A lawn mower using rubber-resin construction for wheels, handles, casings, gears and other parts; non-conductive polyester ladders for electrical work; heat-sealed closures for polyethylene containers; collapsible polyethylene Christmas trees; polystyrene TV picture tube casings; nylon tubing in 3/8-3-in. diameter; and a printing process for Teflon suitable for printed-circuit applications.



BRIGHT PACKAGING gambits lure customers to Dow booth.

PLASTICS-FALL: Cascading pellets could bring rising sales to Eastman.



Typical HARSHAW CATALYSTS

*and How they
are Used*



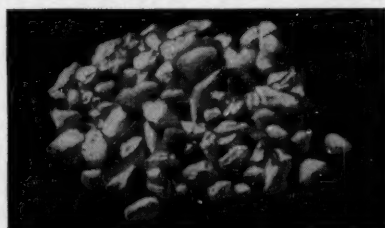
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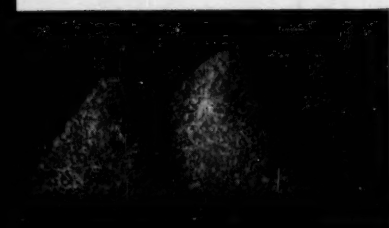
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DEHYDROGENATION CATALYSTS

CHROME-ALUMINA—available in powder or tablet form containing various percentages of chromium oxide supported on high surface area alumina—can be supplied as promoted catalyst and is also available as screened granules.

IRON—tableted iron oxide.

REFORMING CATALYSTS

MOLYBDENA-ALUMINA—supported molybdenum oxide on alumina—available as microspheres for fluid techniques, or as tablets for fixed bed application.

COBALT MOLYBDATE—a supported cobalt oxide—molybdenum oxide catalyst supplied in tablet form.

NICKEL-ALUMINA—a spherical catalyst available as hard spheres measuring $\frac{1}{4}$ " to 1" diameter—used for some types of gas reforming.

DESULFURIZATION CATALYSTS

COBALT MOLYBDATE—a supported cobalt oxide—molybdenum oxide catalyst supplied in tablet form.

ZINC OXIDE—a pelleted zinc catalyst used in the desulfurization of natural gas.

MOLYBDENUM SULFIDE—powdered and tableted molybdenum sulphide.

CHLORINATION CATALYST

COPPER—supported copper catalyst prepared and shipped as tablets or granules.

HYDROGENATION CATALYSTS

NICKEL-KIESELGUHR—supplied as unreduced, or reduced and stabilized, tablets, $\frac{1}{8}$ " to $\frac{3}{8}$ " diameter.

NICKEL-ALUMINA—available in tablet form containing nickel as nickel oxide on high surface area alumina, or in spherical form supported on low area, high-fired alumina.

RUFET FLAKES—reduced nickel protected by hardened oil shipped as free-flowing flakes for hydrogenation of all glyceride and acid fats.

COPPER-CHROMIUM OXIDE—shipped as powder or tablets, stabilized or non-stabilized, with varying ratios of copper oxide to chromium oxide.

NICKEL-ALUMINUM—powdered 50:50 alloy used for preparation of active nickel catalyst for low temperature hydrogenation.

CATALYSTS FOR ORGANIC SYNTHESSES

ZINC CHROME—a tableted zinc oxide—chromium oxide catalyst used in the synthesis of methanol.

MERCURIC CHLORIDE—a granular catalyst consisting of mercuric chloride on active, granular carbon used in the synthesis of vinyl chloride monomer.

COBALT THORIA—available as powder or tablets, a thoria promoted cobalt catalyst employed in Fischer-Tropsch synthesis.

COBALT—a supported cobalt catalyst in pellet form used in the synthesis of hydrogen sulfide.

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ALUMINA—powdered and tableted aluminum oxide supplied as an active, intermediate surface area catalyst.

Whether your requirement is measured in tons or pounds Harshaw can produce your catalyst exactly to your specifications of raw materials, chemical composition, and physical properties such as length, diameter, crushing strength, abrasion resistance, and bulk density. AND, make delivery when you want it. Call on Harshaw today—for further information or technical assistance.

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SALES

Display Technique: Few startling innovations in the art of eye-catching display popped up during the week-long exposition. Bakelite sparked its exhibit with a materials handling truck and a huge, collapsible rubber container for shipping plastic pellets. Barrett stressed melamine dishware on a vertical moving belt that also paraded other products made from Allied Chemical raw materials; several companies spotlighted quick delivery with large maps spotting location of warehouses; and Du Pont telecasted a color TV show from its first-floor booth to an auditorium on the second floor. Too, as always, a great many firms brought sales personnel in from outlying regions to gather new leads at the show, attend company sales meetings.

Consensus: Judging by the exhibition's size (two floors) and attendance, the plastics industry is off to a fast start on further growth.

Less Red Tape

Chemical truckers won't have to submit annual commodity statistics reports after all. That's the upshot of a recent order by the Interstate Commerce Commission, which reverses an edict issued by the ICC last December; 1956 was to have been the first reporting year.

Specifically, the new order exempts "carriers of specific commodities not grouped in classes 1 to 16, inclusive, schedule 20 of the motor carrier annual report form A." This means that truckers whose predominate traffic is liquid chemicals need not comply with the commodity reporting requirement. Not exempted: liquid petroleum carriers, and carriers of refrigerated liquids.

The statistics reports were originally asked for to assist the commission in its regulation of motor carriers, particularly in rate matters.



On the Pike: a Paint Pitch

HIGHWAY promotion for chemical products is becoming bigger and bigger. National Lead has just erected this mammoth 60x120-ft. sign 110 ft. above the Garden State Parkway near Sayreville, N.J. Facing traffic outbound from New York City, the sign delivers a sales message to 3 million people per month.

"Dutch Boy Paints" are advertised by 2 miles of flashing neon tubing at night and the brushing action of a 52-ft. arm holding a paintbrush. Additional attention-getter: a 13-ft.-high, 40-ft.-long clock mounted on top of the sign. Its 10-ft.-high numerals are visible for more than 2 miles.



No matter how you do it, get word to Morton for help in solving any salt problem

The Morton Salt Company offers fast help from salt specialists—at no cost to you. You get the best possible help when we dispatch a Morton Consulting Engineer in your area to your plant. He's an expert when it comes to solving problems relating to salt—and he's backed by the services of chemists and salt scientists at Morton's ultra-modern salt research laboratory.

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many grades of salt for use by the chemical industry. Only Morton has nine strategically located plants to serve you. And only Morton can offer fast delivery from a bag to a trainload, at favorable prices and freight, *anywhere* in the country.

Sending distress signals from a mountain top is advisable only if you're steeped in the code of the hills. The best way to get help, of course, is to write or wire.

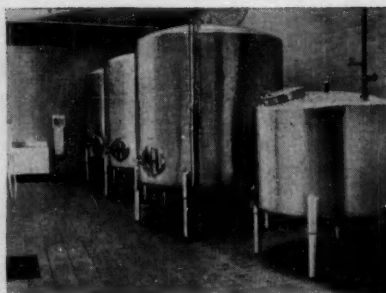
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S A L E S

Shorter Searching

You may soon find it easier to obtain truckers to haul new chemical products as they are placed on the market. Interstate Commerce Commission Examiner Walter R. Lee has recommended that the commission ease restrictions on motor carrier operations by broadening the scope of commodities that can be hauled, and by granting authority for such operations in a given territory without spelling out point-to-point operations.

Until now, ICC has granted trucking rights only for specific commodities between named points; that meant a new ICC certificate had to be obtained before new products could be carried.

The case immediately involved is a request by Quality Carriers, Inc., Burlington, Wis., for permission to operate as a common carrier over irregular routes, and haul all liquid commodities, except petroleum products and milk, between all points in 16 Midwestern states.

In its application, filed December 23, 1954, Quality Carriers told the commission that it had to apply for temporary certificates to carry additional commodities as shipments were obtained. And now it is operating under 28 different grants of authority in the 16 states involved.

In recommending approval of the request, Examiner Lee told the commission that, "the record is convincing that transportation difficulties, on the part of shippers and carriers alike, arise from the existing uncertainty as to whether a carrier's authority to transport a named liquid will also embrace the transportation of the new products appearing in commerce, and therefore in transportation, which chemical research produces."

The commission must still act on the examiner's report. If it goes along with the recommendation, then chemical shippers can expect relief from the delays and expense involved in finding a trucker to haul new products, as well as from the necessity of appearing before ICC in support of a carrier's application. A favorable decision by the commission would certainly bring in other truckers with similar requests.

Such a finding could spur further competition. Already, two new firms are seeking operating authorization for the Midwest area.

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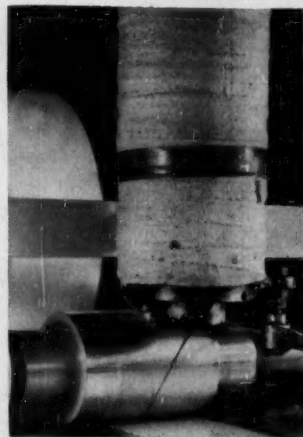
SALES

Fair Trade or Fiction?

"Fair trade" contracts signed by McKesson & Robbins Inc. and independent drug wholesalers were declared by the Supreme Court last week to be illegal price fixing between competitors. The vote: 6 to 3.

In an opinion by Chief Justice Warren, the court held that a manufacturer that also distributes his products cannot legally "fair trade" with independent distributors. This ruling reversed a lower court decision which dismissed Justice Dept. charges that the contracts violated the law.

McKesson contended that its contracts were legal because it signed them as a manufacturer selling to a buyer, rather than as a competing wholesaler. Terming this argument a "fiction" not supported by federal law, Warren said, "parties competing on the functional level cannot sign 'fair trade' contracts."



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HIGH-SPEED sealing of polyethylene film at rates of 500 ft./min. or higher is now possible. Developed by Union Carbide's Bakelite Co., the technique involves extrusion of a hot polyethylene filament between two layers of continuously moving film. The film then passes through rollers which apply sufficient pressure to flatten the molten bead. The method overcomes the slow speed inherent in sealing methods that rely on heating film from the outside.



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P 2063 Chemical Week

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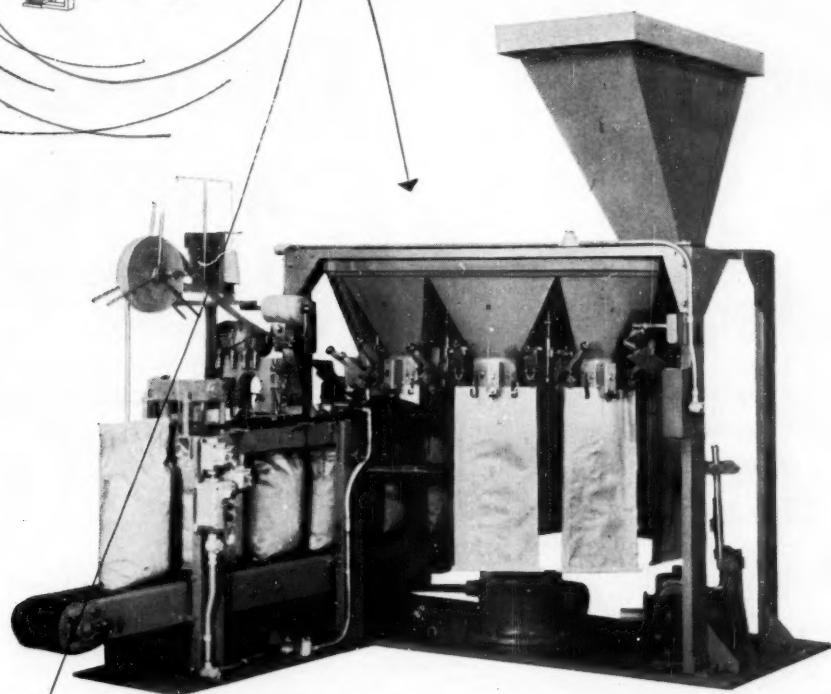
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